Mayonnaise Report

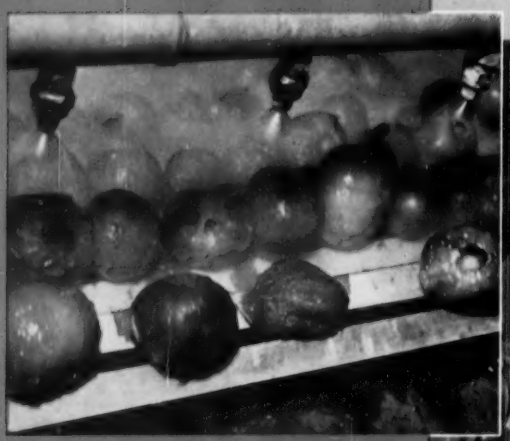
FEBRUARY 1955

35 CENTS

FOOD ENGINEERING

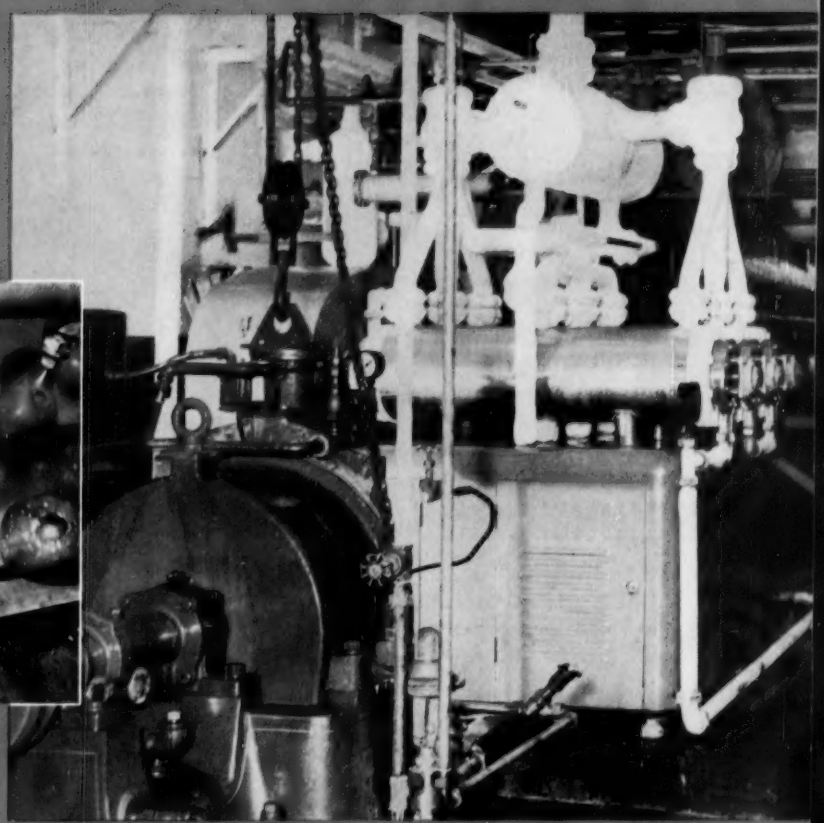
A McGRAW-HILL PUBLICATION

PACKAGING • Fast pneumatic unit forms sausages, drops them to carton. p. 77



PROCESSING • Stripping the peels from tomatoes after hot-air treatment. p. 68

ENGINEERING • Why 27-year-old floors are still good in one food factory. p. 92



QUALITY CONTROL • To retain flavor, high-ester phase of concentrate is separated by freezing, centrifuging. p. 70

ALSO: INGREDIENTS • SANITATION • MAINTENANCE
MATERIALS HANDLING • PRODUCTS • TRANSPORTATION
INSTRUMENTS • PERSONNEL

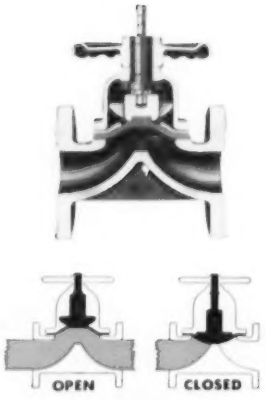
. . . See Contents Classified by Subject, Page 3 ➡

INQUIRY COUPON INSIDE BACK COVER

GRINNELL-SAUNDERS DIAPHRAGM VALVES

In hundreds of installations, the maintenance-saving design of Grinnell-Saunders Diaphragm Valves has accounted for important economies of labor and money. The only part that will in time need replacement is the diaphragm, and depending on the type of service, it may last for years. To replace it takes only a few minutes. You merely remove the four bolts holding the bonnet, leaving the body in the pipe line . . remove the worn diaphragm, insert the new diaphragm . . replace the bonnet and bolt it down. No refacing or reseating required . . no packing glands to demand attention.

Originally perfected for air and water service, Grinnell-Saunders Diaphragm Valves are now widely specified for many other applications. They greatly reduce replacement and maintenance expenses, especially in lines where corrosion, abrasion, contamination, clogging and leakage can be costly factors. Write today for the Grinnell-Saunders Diaphragm Valve Catalog . . and assign your next valve problem to Grinnell.



Other Important Features:

Diaphragm absolutely isolates working parts from the fluid stream

Diaphragm lifts high for full, streamline flow in either direction

Diaphragm presses tight for positive closure

Body, lining and diaphragm materials to suit service

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island — **Coast-to-Coast Network of Branch Warehouses and Distributors**

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

February 1955

Volume 27 Number 2

Contents Copyright 1955 By McGraw-Hill Publishing Co., Inc. (All Rights Reserved)

FOOD ENGINEERING

	INDUSTRY BRANCHES To Which Articles Apply							
	Baking	Beverages	Cereals	Confectionery	Dairy	Fruits, Vegetables	Meats, Fish	Other Foods
Making Mayonnaise and Salad Dressing (Special Report) 83								•
FEATURE ARTICLES								
Tips on '55 Labor Problems 59	•	•	•	•	•	•	•	•
Four Small Plants Become One to Challenge the Top Operators.... 63	•	•	•	•	•	•	•	•
They're Constantly Shaping Top Executives for Tomorrow..... 66	•	•	•	•	•	•	•	•
Peeling by Hot Air-Blast 68						•		
Now—Orange Concentrate With 95% Flavor Esters..... 70		•				•		
Achieves Quick Success Through New Know-How 72	•	•	•	•	•	•	•	•
Pneumatic Molder Quickly Shapes Product Portions 77				•	•		•	•
See Big Future in Canned Drinks and Launch Lines to Back Belief 78		•						
Streamlined Handling Cuts Process Time 80						•		
Farsighted Test of Flooring Pays Big Dividends..... 92	•	•	•	•	•	•	•	•
Chart Quickly Tells Thermal Conductivity 94	•	•		•		•		•
How to Select Your Sanitarian—And What He Must Do..... 95	•	•	•	•	•	•	•	•
Wet Spent Grains Dried Non-Stop 97		•						•
Winning Sure Control of Quality in Materials, Processes, Goods... 98	•	•	•	•	•	•	•	•
New Casing for Food Can be Eaten 105					•		•	
Controlled Drying Technique Speeds Reduction, Protects Quality.. 107			•					•
Long John Donuts at 10 Dozen a Minute 113	•							
Carries Payloads Every Run 114	•	•	•	•	•	•	•	•
Sets Pace in Freezing, Breading Operations (Foldout Flowsheet) 118			•				•	•

DEPARTMENTS

Practical Ideas 5
In Behalf of Progress.....116
New Equipment & Supplies.129
New Packages & Products 162
Advances in Technology 171
Questions & Answers.....188
Useful New Books.....196
Keeping Up With Field...199
Hors d'Oeuvres.....201
Schedule of Events.....204
Recent Inventions 210
Men & Companies.....216
Just Off the Press.....220
Advertisers' Index 230
Readers' Service.....last page

CONTENTS CLASSIFIED BY SUBJECTS

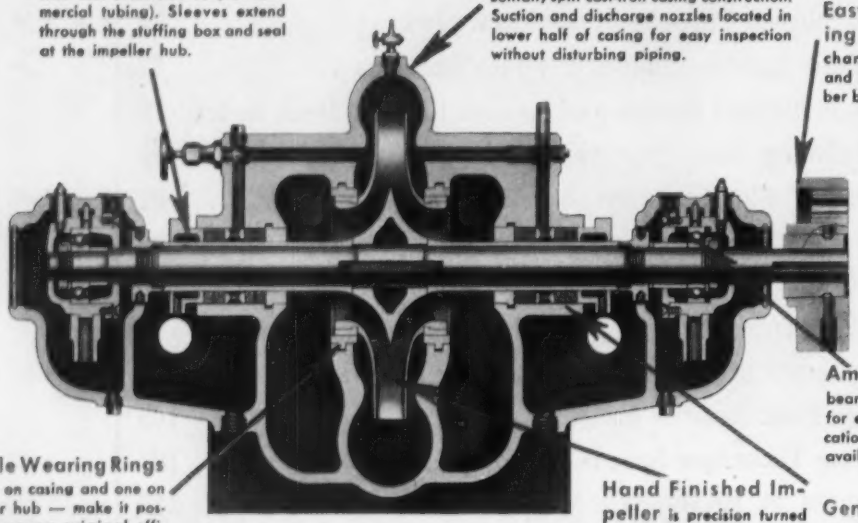
INGREDIENTS: Making Mayonnaise, Salad Dressings, 83; also 77, 98, 107, 113, 224.
INSTRUMENTS: Controlled Drying, 107; also 77, 118, 130, 135, 137, 139, 146, 224.
MANAGEMENT: Tips on Labor Problems, 59; Four Small Plants, 63; Shaping Top Executives, 66; also 72, 95, 118, 196, 223.
MATERIALS HANDLING: Streamlined Handling, 80; also 5, 9, 70, 72, 78, 114, 118, 130, 131, 133, 137, 141, 146, 149, 150, 221.
PACKAGING: Quickly Shapes Portions, 77; Canned Drinks, 78; also 7, 9, 63, 72, 105, 113, 118, 129, 133, 135, 171, 212, 224.
PLANT ENGINEERING: Farsighted Floor Testing, 92; Tells Thermal Conductivity, 94; Donuts, 10 Doz. a Min., 113; Sets Pace in Freezing, 118; also, 5, 7, 11, 63, 68, 70, 77, 78, 80, 107, 129, 130, 133, 135, 137, 139, 141-3, 153, 196, 213, 220.
PROCESSING: Peeling by Hot Air, 68; Achieves Quick Success, 72; Making Mayonnaise, Salad Dressings, 83; also 9, 13, 70, 77, 97, 98, 107, 113, 118, 131, 135, 142, 162, 171, 172, 175, 190, 210, 224.
PRODUCTS: Orange Concentrate, 70; Achieves Quick Success, 72; New Casing, 105; also 68, 77, 78, 97, 107, 113, 118, 157, 194, 195, 199, 210.
SANITATION: Achieves Quick Success, 72; Selecting Your Sanitarian, 95; also 83, 98, 105, 107, 118, 130, 171, 191, 223.
PERSONNEL: Tips on Labor Problems, 59; Shaping Top Executives, 66; Selecting Your Sanitarian, 95; also 63, 199, 223.
TRANSPORTATION: Four Small Plants, 63; Carries Payload Every Run, 114; also 11, 72, 118.
MAINTENANCE: Farsighted Floor Tests, 92; also 139, 154, 157, 222.
QUALITY CONTROL: Orange Concentrate, 70; Achieves Quick Success, 72; Winning Control of Quality, 98; also 68, 70, 77, 83, 97, 105, 118, 135, 171, 175, 179, 191.

FE STAFF

PUBLISHER *Edwin D. Fowle*
EDITOR *Frank K. Lawler*
SENIOR ASSOCIATE EDITOR *A. V. Gemmill*
SENIOR ASSOCIATE EDITOR *C. R. Havighorst* SAN FRANCISCO
MANAGING EDITOR *Herb Powell*
ASSOCIATE EDITOR *John V. Ziemba* CHICAGO
ASSOCIATE EDITOR *Ivan C. Miller*
ASSISTANT EDITOR *Leonard Trauberman*
ART EDITOR *Edward P. McGrath*
CONSULTING EDITORS *E. D. Kirkpatrick, R. S. McBride*
WASHINGTON *G. B. Bryant, Jr.*
WORLD NEWS *John R. Wilhelm*
ECONOMICS DEPARTMENT *Dexter M. Keezer*
SALES MANAGER *G. E. Riddell*

Get 8 Advantages of GOOD PUMP DESIGN

ALLIS-CHALMERS Double-Suction PUMPS



Longer Shaft Sleeve Wear with cast shaft sleeves (not commercial tubing). Sleeves extend through the stuffing box and seal at the impeller hub.

Greater Rigidity with heavy horizontally split cast-iron casing construction. Suction and discharge nozzles located in lower half of casing for easy inspection without disturbing piping.

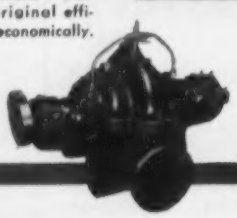
Easy Coupling Mounting with *Magic-Grip* quick change bushings for pump and drive shaft. Pin and rubber bushing type usually used.

Ample Bearings — Ball bearings may be furnished for either oil or grease lubrication. Split shell bearings also available in larger sizes.

Double Wearing Rings — one on casing and one on impeller hub — make it possible to renew original efficiency easily and economically.

Hand Finished Impeller is precision turned and carefully balanced to assure vibrationless operation and close wearing ring clearance.

Generous Stuffing Box with sufficient packing to keep stuffing box maintenance low. Provision made for sealing water connection or grease seal if required.



Wide Choice of Materials is available for all types of service — iron, bronze, stainless steel and combinations.

HEAVY DUTY CONSTRUCTION with no skimping, no corner cutting is what you'll find in Allis-Chalmers double-suction pumps. Extra metal thicknesses, extra strong parts, extra features and extra careful workmanship add up to long life, low maintenance, and low cost per gallon pumped.

Every Allis-Chalmers double-suction pump is carefully tested on the most modern testing equipment in the industry. Each installation is individually engineered by men whose experience in thousands of pump installations will give exactly the right pump for your needs. Stock sizes from 10 to 7000 gpm with heads to 475 feet.

Complete Pumping Unit

Allis-Chalmers can furnish the complete installation — pump, motor, control and drive — all built of coordinated design and manufacture.

Whatever your pumping problem, call your A-C Authorized Distributor or District Office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 08B6146.

A-4590

ALLIS-CHALMERS

PRACTICAL IDEAS

Ends Dockside Accident Hazards

At Wilson & Co.'s Cedar Rapids, Iowa, plant, chances of injury have been greatly reduced at the location where palletized cases of meat are loaded into refrigerator cars.

No longer are either wood or metal ramps employed to bridge the space between car and loading dock.

Notched uprights—(A) in left photo—have been imbedded in the floor of the loading dock opposite the car doors. Resting in the notches is a steel rod (B) which supports one end of tilted platform (C) that spans from loading dock to car. On to this platform is placed a dolly to receive the loaded pallet for transfer.

Whether loading into a car or truck, the pallet of cases is rolled on the dolly to the proper location in the vehicle for unloading the cases and stacking them. The dolly (right photo) stays in truck for next loaded pallet.—*"Wilson's Certified News," Wilson & Co., Chicago.*

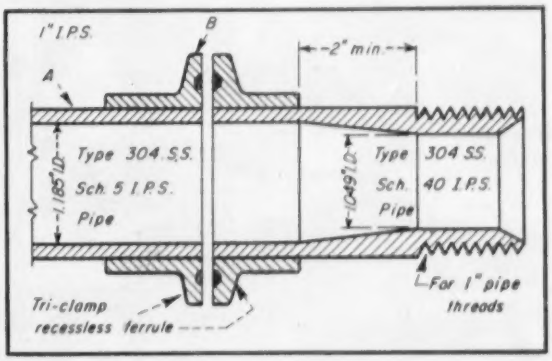
Adapter for Stainless Steel Pipe

Though specially designed equipment is generally employed for sanitary processes, nevertheless a new layout often calls for other equipment or transformation of old units.

As a result, an adapter frequently is needed to permit use of facilities with screwed connections.

Our unit (see sketch) has been very satisfactory for adapting screwed couplings on tanks and pumps to sanitary fittings. Undercutting on the adapter is done on a motorized threading machine or with a lathe.

To the pipe—(A) in sketch—is attached the standard sanitary tri clamp (B). The pipe may be either IPS of Schedules 5 or 10, or can be sanitary pipe. It is necessary



FOOD ENGINEERING
(Formerly Food Industries)

February 1955 Vol. 27, No. 2

Member ABC and ABP

Published Monthly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office 99-129 N. Broadway, Albany 1, N. Y. Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** Donald C. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President & Treasurer; John J. Cooke, Secretary; Paul Montgomery, Executive Vice-President, Publication Div.; Ralph B. Smith, Vice-President and Editorial Director; Nelson Bond, Vice-President & Director of Advertising; J. E. Blackburn, Jr., Vice-President & Director of Circulation.

Subscriptions: Address correspondence to Food Engineering—Subscription Service, 99-129 N. Broadway, Albany 1, N. Y. or 330 W. 42nd St., New York 36, N. Y. Allow one month for change of address.

Subscriptions are solicited only from the executives, engineers, and technologists in food processing plants. Position and company connection must be indicated on subscription orders.

Single copies 35¢. Subscription rates—U. S. and possessions $2 for 1 yr., $3 for 2 yr., $4 for 3 yr. Canada, $2 for 1 yr., $4 for 2 yr., $5 for 3 yr. Other Western Hemisphere countries and the Philippines, $10 for 1 yr., $16 for 2 yr., $20 for 3 yr. All other countries, $15 for 1 yr., $25 for 2 yr., $30 for 3 yr. Entered as 2nd class matter Aug. 26, 1948, at Post Office at Albany, N. Y., under Act of Mar. 3, 1879. Printed in U.S.A. Copyright 1955 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.

Louisville Method

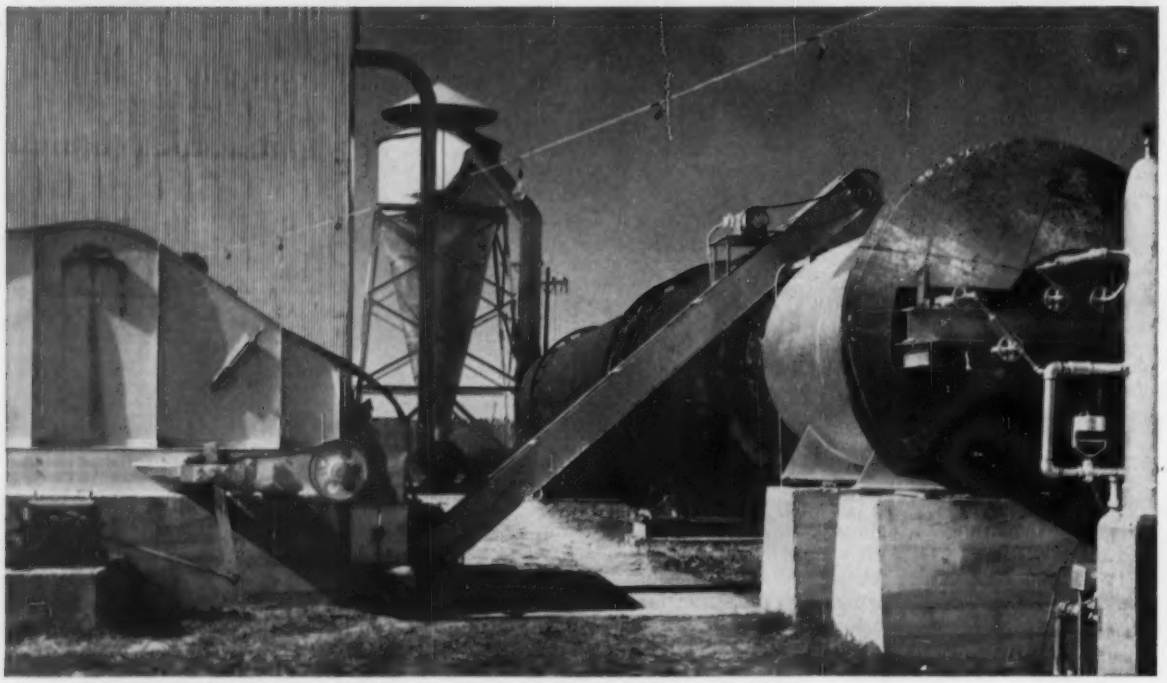
Type H Dryer User Reports . . .

"alfalfa brings premium prices . . . drying costs are *lower!*"

Louisville Type H Dryer keeps carotene content high. This top quality commands top prices anywhere. And the big production capacity of this dryer means lower drying costs, too.

The Type H Dryer, developed to retain maximum carotene value in chopped alfalfa, is also useful for handling other feedstuffs, including sweet potatoes, bagasse and sugar beet pulp, pea and soybean vines, green corn, vegetable waste, etc. Its combination of low temperature drying and large capacity will save you money on production costs and enable you to turn out a high quality product.

With our 53 years of drying experience for all types of industry, we may be able to add extra profits for you, too. Write for our Type H Dryer bulletin. Or ask for a Louisville engineer to look over your drying operation.



LOUISVILLE DRYING MACHINERY UNIT

GENERAL AMERICAN TRANSPORTATION CORPORATION

Dryer Sales Offices: 139 So. Fourth Street, Louisville 2, Kentucky • 380 Madison Ave., New York 17, New York

General Offices: 135 So. LaSalle Street, Chicago 90, Illinois

In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario

OFFICES IN ALL PRINCIPAL CITIES

to purchase a ferrule for the specific pipe. As an example, a standard IPS tri-clamp ferrule will be required for the adapter side of the joint if connected to an IPS Schedule 5 or Schedule 10 pipe, on the other side of the joint.

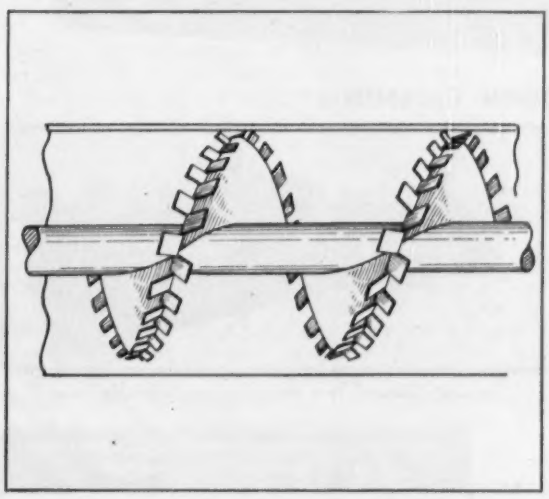
On the other hand, if a sanitary pipe is being connected to the adapter, a tri-clamp ferrule for sanitary pipe will be needed. It should be noted these ferrules are now standard for light gage IPS pipe and for sanitary pipe and that they are available from most distributors.

Any difference in outside diameters between an IPS and a connecting sanitary pipe will be taken care of with the tri-clamp connection. For example, the sketch shows a 1-in. IPS Schedule 40 pipe connected to a 1-in. IPS Schedule 5 or Schedule 10 pipe.

However, a 1-in. sanitary pipe might have been used equally well to provide the correct ferrule as purchased. In the event that a special ferrule for the sanitary pipe is not purchased, a regular ferrule for the IPS pipe can be machined to the correct diameter for the sanitary pipe.

Tapers and threads on the Standard Schedule 40 IPS pipe used to form the adapter were made with a standard motorized Beaver pipe threading machine. Taper was made employing a reamer frequently found in well-equipped machine shops. However, many mechanics prefer to make their own reamers for this work. Alloy metal pipe will ream very readily, especially stainless steel alloys such as 316 or 304. Finally, it is advisable to polish the surface with a No. FF emery cloth.

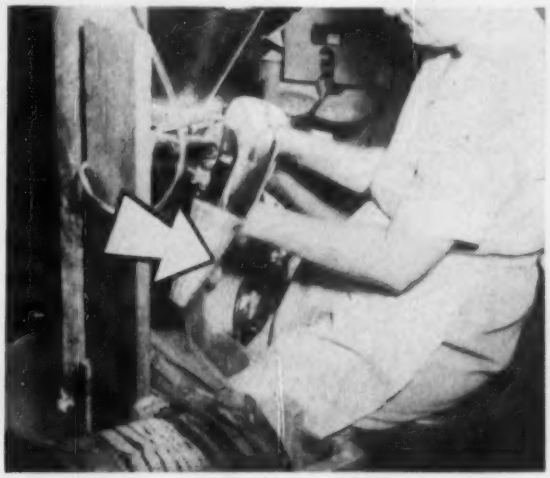
This adapter can be made on a machine lathe or a motorized threading machine without making any changes. In a lathe, the ream is used in the same manner as a boring bar, whereas in the pipe machine, the ream is held in the die chuck. When using a standard pipe-threading machine a nipple chuck is helpful.—*Dr. C. E. Goulding, Project Manager, Bioquimica, S. A., c/o General Industries, Philadelphia.*



Screw Conveyor Serves as Grinder

In the process of converting to meal 600 tons of herring per 24 hours by continuous wet reduction process, the fish is conveyed by screw conveyors into cookers, presses and direct-flame rotary driers. After the product is dried it is cycloned to the grinders where formerly the dried pieces of fish were often too big for the capacity of the grinders.

To overcome this we added a grinding operation to the transporting of a screw conveyor delivering the pressed product to the driers. We merely made 1½ in. deep cuts in the screws (see sketch) and then bent them in opposite directions. No hunks of fish that are too large for the grinder to handle now get past the screw-conveyor disintegrator.—*P. A. Bauchesne, Chemist, Canapro Ltd., Grindstone, Magdalen Island, Quebec, Canada.*



Hair Dryer Aids Package Filling

A piece of equipment standard in hairdressers' shops has—strange as it may seem—solved a production problem at Igleheart Division, General Foods Corp., Evansville, Ind.

Marketing demands had required installation of an extra line for hand-packing cake mixes, supplementing the high-speed line. And in this manual operation, a worker positioned glassine bags at a filler spout, which automatically filled the bags with the mix. Bags then were placed on a conveyor, heat-sealed, and cartoned.

To make it easier for the operator to grasp the empty bags before positioning them at the spout, the company tried the idea of directing blasts, from its compressed air system, against the tops of the bags resting in the magazine.

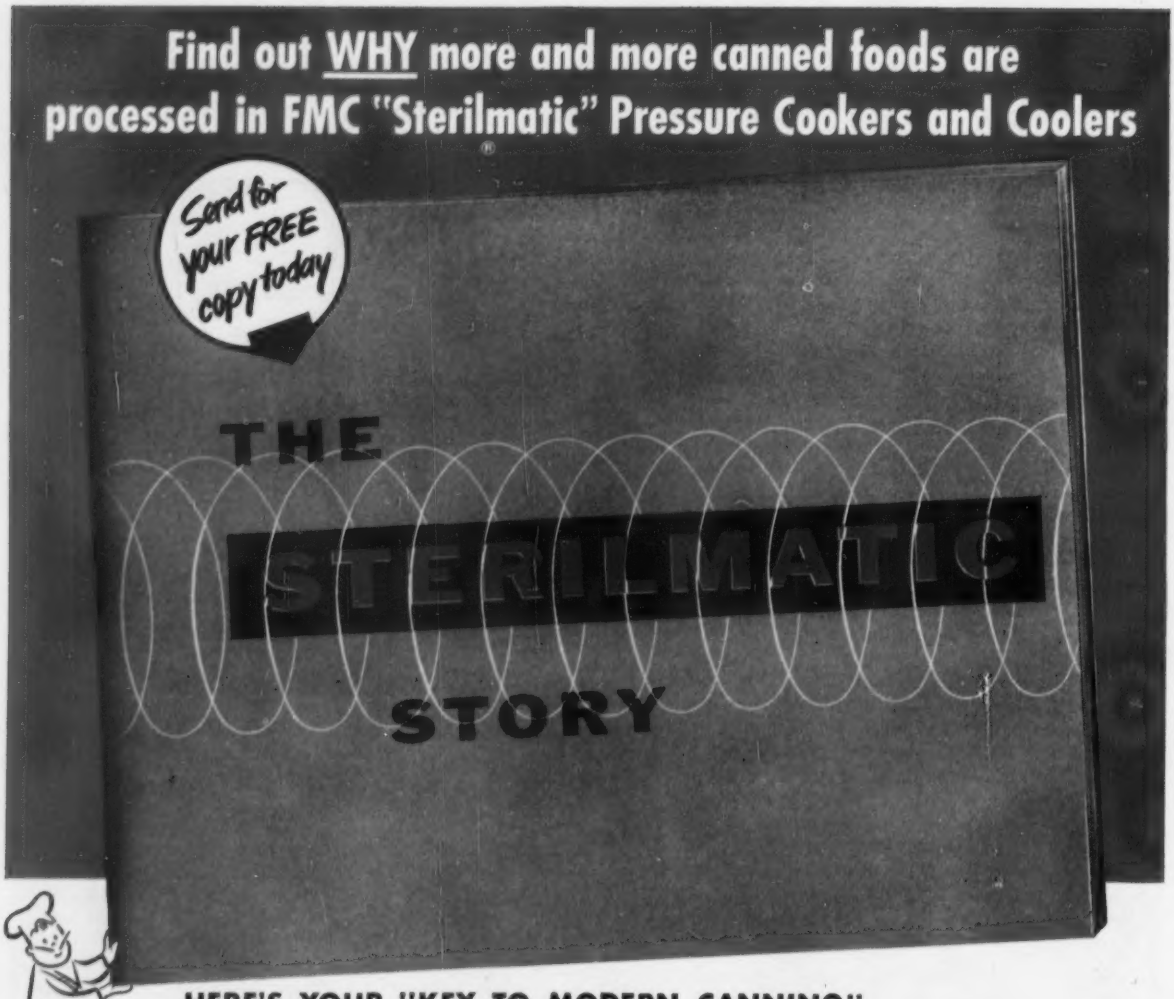
The blast opened each top bag in such manner that all the girl had to do was insert her fingers inside it and remove it from the magazine. However, in spite of the use of a separator and filter in the air line, oil and water occasionally got into some bags. And naturally this couldn't be tolerated.

Accordingly, the company's methods-and-standards department renewed the search for a solution. True enough, it was found that specific manufactured equipment could be purchased for doing the job. But here it would have required modification, and further it was considered that this equipment was too elaborate and the cost rather high.

Then it occurred to us that a hair dryer might be the answer. So we bought test units for each of the four filler stations. The heating elements in the dryers were disconnected, and specially made cones (see photo) were attached to direct the air blasts in the desired manner. Dryers, together with the cones, cost a mere $23 per unit.

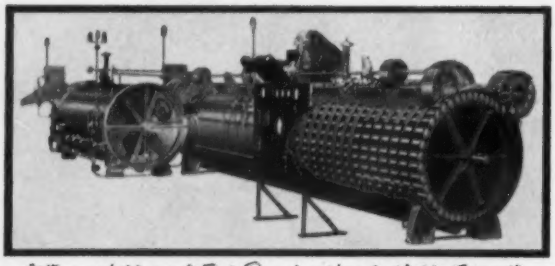
These dryers (Oster Airjects, Model 202, John Oster Mfg. Co., Racine, Wis.) have now been in operation for upward of a year on a 24-hr. basis daily, and they have required no maintenance. Their satisfactory performance seems to prove that you can't look too far—even into a beauty shop—for the answer to a plant problem.—*R. P. Nace, Superintendent, Specialty Products, and P. A. Neuschwanger, Supervisor, Methods & Standards, Igleheart Div., General Foods Corp., Evansville, Ind.*

Find out WHY more and more canned foods are processed in FMC "Sterilmatic" Pressure Cookers and Coolers



HERE'S YOUR "KEY TO MODERN CANNING"

This colorful 20 page brochure describes the "Key to Modern Canning"—food processing techniques and equipment that have virtually revolutionized the canning industry. See for yourself how this famous "in-can" method of sterilization provides the precise processing control needed to maintain highest standards of product quality and uniformity. Use the handy coupon for your free copy of "The Sterilmatic Story."



"The most Advanced Food Processing Lines Available Today!"

Key to food equipment

FOOD MACHINERY
AND CHEMICAL CORPORATION
Canning Machinery Division

General Sales Offices:
WESTERN: SAN JOSE, CALIFORNIA • EASTERN: HOOPESTON, ILLINOIS

FOOD MACHINERY AND CHEMICAL CORPORATION
333 W. Julian St., San Jose 6, Calif.

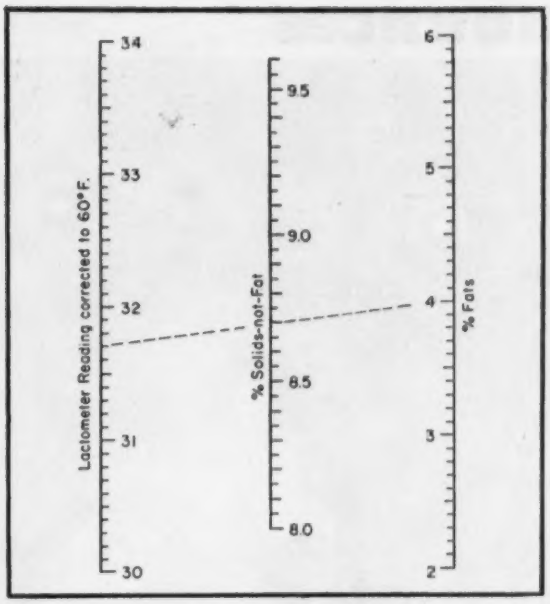
Please send me a copy of your brochure "The Sterilmatic Story."

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____



Milk Nomograph

The utilization and processing of milk for preparation of products nutritionally rich in solids-not-fat content have stressed the need for an accurate method of estimating the percentages of solids-not-fat in milk. The Agricultural Marketing Service in a study based on the measurement of the composition of over 2,700 samples of milk from the western and midwestern United States (Marketing Research Report No. 65) have recommended the following equation as representative of the samples tested:

$$N = 0.307 + 0.219\,F + 0.237\,L$$

where N is the percentage of solids-not-fat, F is the percentage of fat, and L is lactometer specific gravity.

For this test the reading of the lactometer, a standard Quevenne, is made at the top of the meniscus at a temperature of approximately 60°F. The reading is adjusted by adding 0.1 for each degree above 60°, or by subtracting 0.1 for each degree under 60°. Accurate measurement of the temperature of the sample is made just prior to reading its specific gravity.

The accompanying nomograph facilitates use of this equation. To determine the percentage of solids-not-fat of a sample of milk which contains 4 percent fat and tests 31.7 lactometer degrees when corrected for temperature, place a straight edge, connecting 4 on the % Fat scale (right scale) with 31.7 on the Lactometer scale (left scale), the middle scale is intersected at 8.70, the % Solids-not-fat.—*Joseph T. Hogan, Chemical Engineer, New Orleans.*

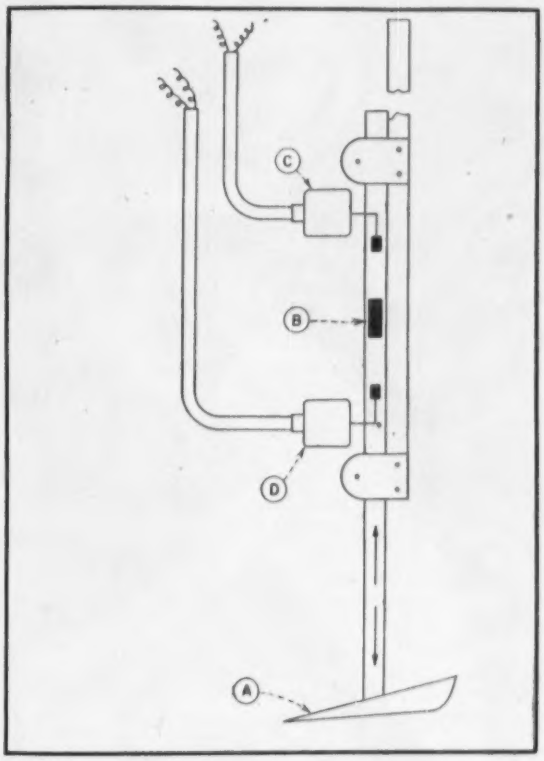
Make Bottom Heaviest in High Stacks

A worthwhile safety hint that can't be repeated too often is accented in *It's Your Business*, publication of American Meat Institute—a hint that applies throughout the food industry.

It is this: First thing to remember about storing and piling supplies, which always take up a great deal of space in the packing house, is to keep heavy materials on the bottom.

No matter by what method a stack is formed, make certain that the bottom tier can support the weight of items on top.

Too many severe personnel accidents occurring in food plants are the result of topping stacks, to say nothing of the damage resulting to the materials.



Food Hopper Level Control

Difficulty was experienced at our plant in maintaining accurate weight of fill in cartons (frozen lima beans), unless we kept a fairly constant level of product in the revolving feed hopper. Holding the level in the feed bowl required manual operation of the start-stop controls of the vibrating feed to the filler hopper. Not only was this method undependable, but it tied up operator.

Since installing our company-made automatic control device, uniform fill is assured.

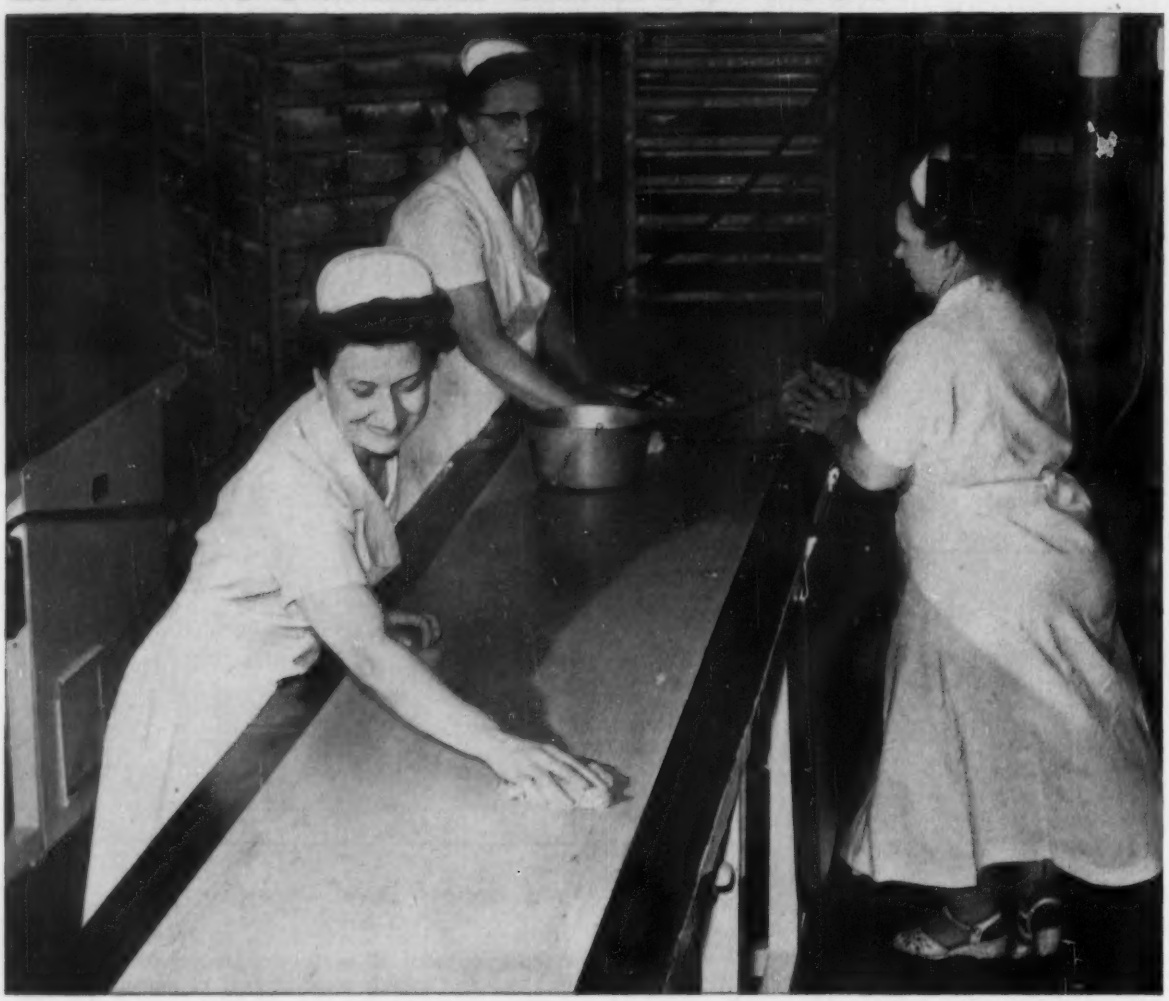
Operating arm of the control consists of a ski-shaped shoe—(A) in sketch—attached to the bottom of a slide bar. Though stationary on the bar, the shoe rides lightly and smoothly atop the product while the hopper and contents turn beneath it.

As the slide bar raises and falls, a half-moon key (B) engages first one and then the other of two microswitches (C) and (D). In turn, these control the magnetic starter on the vibrating feed conveyor. Wired in the same way as the remote two-button start-stop control which they replaced, one of these micro-switches is the normally open type and the other the normally closed type.

Also installed is an SPST toggle switch in series with the NC microswitch (stop switch) to be used by the operators as a secondary control at the filler.

This arrangement not only assures a more accurate fill, but has relieved workers of the responsibility of starting and stopping the conveyor every few minutes. Now operators can concentrate on more important jobs.—*Joseph A. Houtman, Product Supervisor, J. H. Delaney & Sons, Inc., Bridgeville, Del.*

B. F. Goodrich announces



Koroseal belt washes like glass, cuts cleaning time in half

STICKY icings, jelly, most stains wipe right off that belt with just a damp cloth. That's because it's made of Koroseal, the flexible material developed by B. F. Goodrich.

The Koroseal belt has a smooth, polished surface that even oil can't penetrate. Food particles can't grind in. So there's no need to scour it. A few seconds with a damp cloth and the Koroseal belt is clean and looks as new as the day it was put on. No wonder users say it cuts cleaning time in half. And since Koroseal is completely, permanently waterproof, the belt cover never gets damp or soggy, and so can be used right after washing.

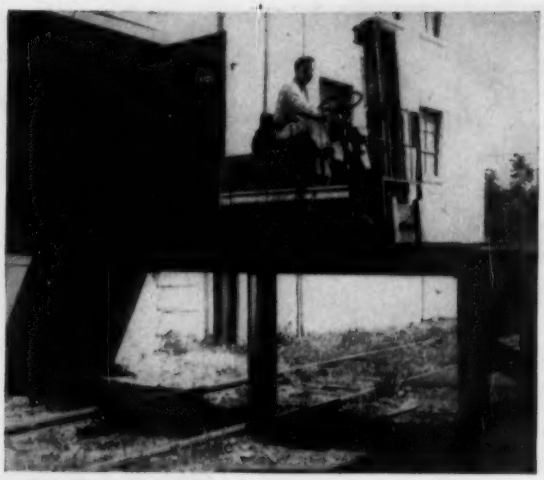
Koroseal resists cracking and peeling, doesn't get sticky. And there's no danger of contamination with Koroseal because it is nontoxic, and has no odor or taste to transfer to foods. With its high resistance to cooking oil, animal fats, and most acids, the Koroseal belt is ideal for bakeries as well as places where meats, nuts, greasy pans are handled.

Two other belts, developed by B. F. Goodrich for food handling, are called Highseal and Kleenseal and are made of new types of rubber compounds. Their "sight-saving" green color reduces glare and eyestrain on packaging and inspection lines.

It will pay you to find out more about these work-saving, money-saving improvements in food handling. First step is to have your BFG distributor survey your belting needs and recommend the right B. F. Goodrich belt for your process. If you don't know the distributor nearest you, write us and we'll send his name. *The B. F. Goodrich Company, Dept. M-365, Akron 18, Ohio.*

Koroseal—T.M. Reg. U. S. Pat. Off.

B.F. Goodrich
INDUSTRIAL PRODUCTS DIVISION



Rail Crossing Via Vanishing Bridge

As our need for more warehousing and processing space increased, new buildings were constructed on both sides of a railroad spur tracks. Relatively large stocks are stored in the two warehouses separated by these rails. Moving finished goods in or out or across the tracks to the assembly and truck-loading point posed a trying problem. We unraveled the tangle by devising a "disappearing" drawbridge.

Lifting-lowering part of this bridge is a converted, standard, hydraulic grease-hoist (see left photo) used in service stations for elevating cars. We merely extended the frame slightly, squared off the ends, and for the runway, welded a steel plate to cover the frame.

The "bridge" is supported at five points—by the center piston and by two steel legs at each end. These swing down when the bridge is in place. Runway has more than sufficient strength to support a loaded lift-truck. It is well constructed and supported.

About one minute is required to raise or lower the bridge. We know in advance when the switch engine is to bring a rail car over the spur track and, also, when it will return to remove a loaded car.

Just before a train arrives, the bridge operator lowers the hydraulic lift. To do this, he first raises the runways so that it clears the two docks, then manually swings it parallel with the tracks until it is lowered below their level (right photo). To raise the bridge in position between the two warehouses operator reverses the procedure.—*Glenn Danielson, Food Technologist, Nalley's Inc., Nalley Valley, Tacoma, Wash.*

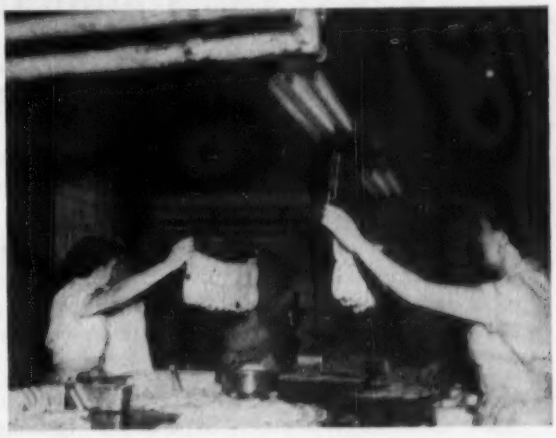
Fatigue Cut, Work Speeded

Employees working at the sausage stuffing table in the Chicago plant of Marhoefer Packing Co. are now saved a frequent, fatiguing walking interruption.

Formerly, they had to move a distance up to 12 ft. each time they twisted 120 linked sausages around a stainless steel rod and put load on a monorail suspended rack.

Device that simplifies and eases the work is a company designed trolley system for moving, by a simple hand push, each rod of 120 links of sausage from each twisting station to rail suspended racks at the end of the stuffing table.

Installed were four trolleys (photo), two on each side of the stuffing table. Each system comprises two pairs of trolleys, each pair riding on a ¼-in. wire over the table. This wire is attached to ceiling-suspended pipes of 1½-in. dia. at both ends of the table.—*FE Staff*



CAN YOU USE $50?

Then here's an opportunity to get it.

Send one of your ideas to FOOD ENGINEERING.

Each month $50 is presented to someone like you for the best item in this department. And the chance that it will be you is now running about one in twelve.

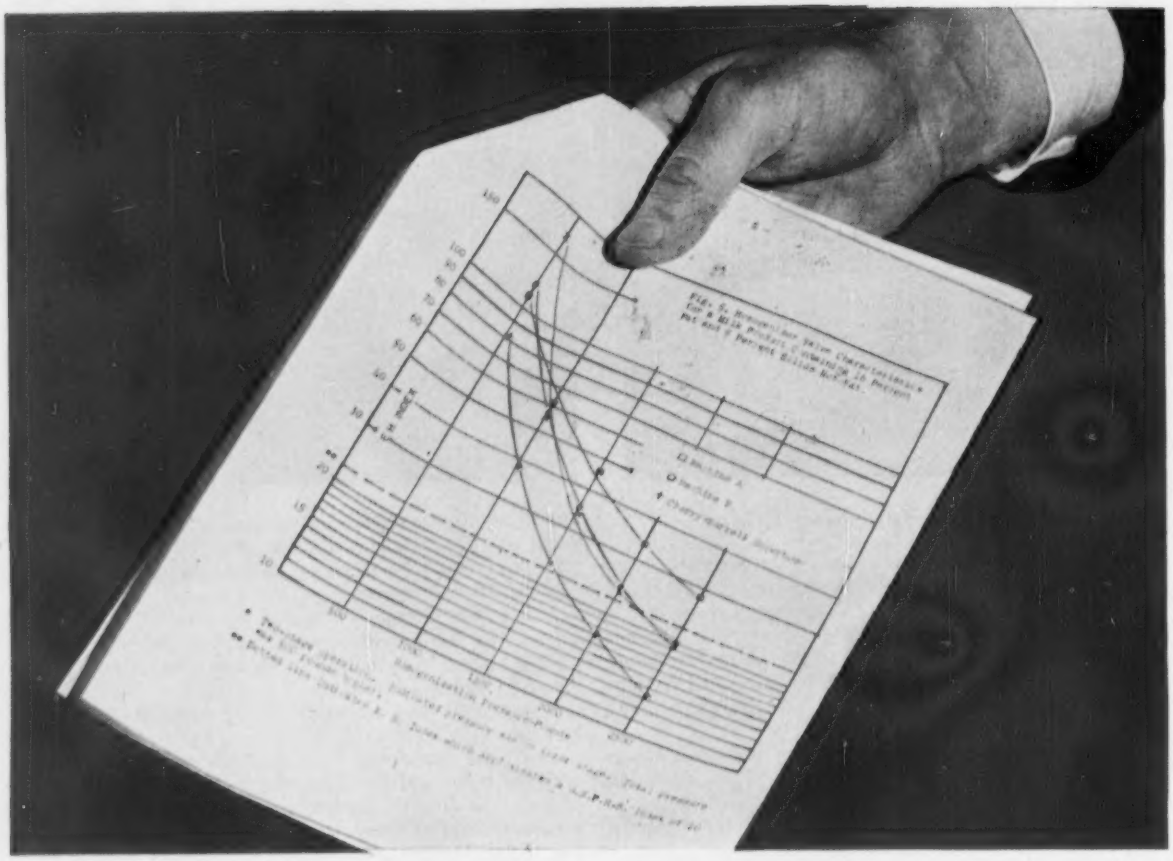
Also, $5 to $15 is paid for each contributed item used. So a few minutes time may net you as high as $65.

Just send us the facts about your idea and its application. And include a free-hand sketch or snapshot to illustrate it.

We'll do the finished writing and drawing for you.

Send it today, before you forget. Address it to Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.—The Editors

DECEMBER PRACTICAL IDEA WINNER was "Reverse Flow Improves CIP," submitted by John J. Buhr, Sales Manager, The Creamery Package Mfg. Co., St. Louis, Mo.



Here's the independent report that sells SUPERHOMO homogenizers sight unseen!

Once you glance through this impartial research report, *you'll never be impartial toward homogenizers again!*

We did not make the tests. All we did was submit our standard homogenizing valve, as did other manufacturers, to an independent research laboratory. Impartial and scientific testing then determined which valves were most efficient.

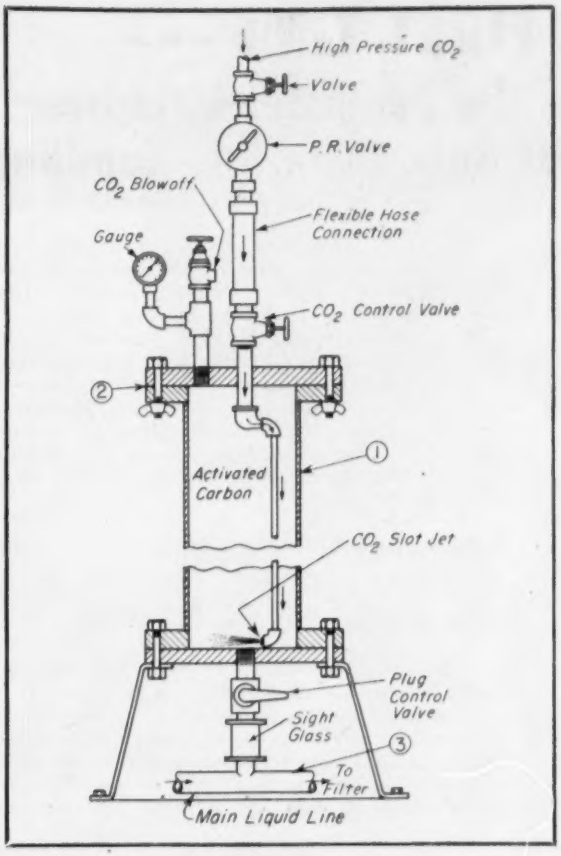
You've guessed it. This report proves beyond all doubt that Cherry-Burrell "Superhomo" homogenizers outperform all others—often by a considerable margin. When you see the report you'll learn just how big the margin is.

The Tests: To homogenize milk, evaporated milk, half and half and low-test cream under standard conditions to determine the efficiency of various makes of homogenizing valves.

The Results: On all products, the Cherry-Burrell "Superhomo" homogenizing valve surpassed the minimum requirements for efficient homogenizing, and did so using far less pressure than any other valve. Less pressure, less wear, less horsepower mean less operating expense with "Superhomo"—and more efficient homogenization.

ASK THIS MAN...
your Cherry-Burrell Representative—to show you "Operating Characteristics of Some Commercially Available Homogenizer Valves"—the impartial report that proves you get more efficient homogenization, spend less money to get it—with "Superhomo."

CHERRY-BURRELL CORPORATION
427 W. Randolph Street, Chicago 6, Ill.
Equipment and Supplies for Industrial and Food Processing
FACTORIES, WAREHOUSES, BRANCHES, OFFICES OR DISTRIBUTORS AT YOUR SERVICE IN 56 CITIES



Carbon Slurry Feeder

Common way to make a brewing slurry of activated carbon and water is to employ a suitable tank equipped with a baffle and mechanical agitator. Slurry is then injected into the beer or water stream by a proportioning pump. But we have found that cost of proportioning equipment discourages adoption of this system.

We tried feeding carbon simultaneously with the diatomaceous earth slurry, but discovered that this combination reduced the throughput of our filter. The situation is improved by first precoating the filter with diatomaceous earth alone. Then, by adding the activated carbon to the slurry tank, we found we were able to feed it continuously with filter aid.

Nevertheless, difficulties arose when it became necessary to flush out the filter during a filtration cycle.

This problem was circumvented by designing and constructing a very simple pressure feeder for activated carbon slurry. There are no moving parts, and the unit operates independently of the filter powder slurry feeder. Also it has presented no problems in sanitation or mechanical failures.

The pressure feeder (see sketch) was built in our shop. The cylinder (1) is stainless steel piping of 6 in. dia. and, for our requirements, made 4 ft. in height. Both ends are closed by companion flanges (2). And the upper, secured by wing nuts, has two apertures. One of these is for the supply of CO_2 (or for air in the case of water) and the second for blow-off purposes.

The bottom flange, with a ¾ in. outlet, controls the rate of slurry feed by a plug valve that is in turn connected by a sight glass to the main liquid line (3).

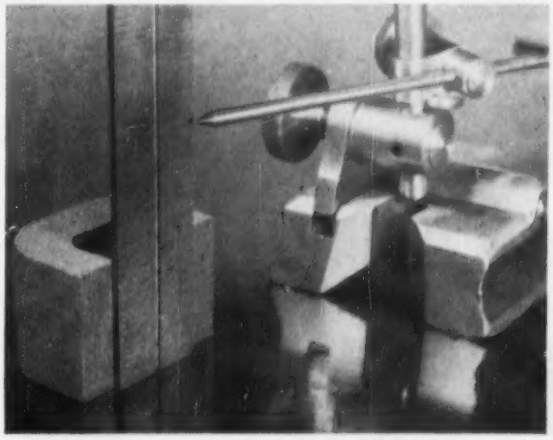
The gas supply, controlled by a regulator, is connected into a ¼-in. pipe set off center. End of this small pipe for CO_2 discharge is capped and slotted, and set as close as possible to the bottom of the cylinder.

With this arrangement a continuous stream of CO_2 passes through the outlet, through the slurry (1½ lb. of activated carbon to a gallon of water), and finally through the blow-off. This action prevents the discharge side of the cylinder from becoming plugged, because it keeps the carbon in a state of suspension. Excess pressure of approximately 5 psi. in the slurry tank over that present in the main liquid line is advisable, since this permits a continuous, uniform carbon feed.

While the precoating operation is in progress with diatomaceous earth, outlet plug of the carbon slurry tank is kept closed. During this time, however, gas is fed continuously through the slurry to insure against the carbon settling and plugging the slurry outlet.

After the filter has been properly precoated with diatomaceous earth, carbon is fed continuously to the beer as it flows through the main beer line.

When cleaning this equipment, it is only necessary to disconnect the gas supply, loosen the top flange, and remove the cover together with the initial gas line. The inside surface of the slurry vessel is then accessible for thorough cleaning.—*Sig. Lingelbach, Master Brewer, A. Gettleman Brewing, Milwaukee.*



Shop Use of Permanent Magnets

Apart from the number of standard tools which are based on the use of permanent magnets, the ordinary magnet by itself can be employed to make shop work easier.

An example of this is in the maintenance shop where much marking-out of machine parts on the surface plate is to be done. Lines are scratched on vertical work surfaces by setting the scribing point a known distance up from the marking-out table top. One way of doing this is to stand vertically on the table a good quality steel rule so that the scribing point can be aligned with the rule graduations.

An efficient holder for standing the rule vertically can be made from a stock permanent magnet of the horseshoe type (see photo) and used in the manner shown. The area in contact with the marking-out table should be surface ground to a right angle with the pole faces of the magnet to ensure that the rule stands vertically. Not only does the magnet hold the rule securely, it also adheres to the metal table top so that the whole assembly is held rigidly and will not fall over—a trouble which is often encountered with non magnetic rule holders.—*C. T. Bower, Tool Engineer, London.*

SHOWING FOR THE FIRST TIME - - -

A New Addition to the Dempster-Dumpster System of Low Cost Bulk Materials Handling

Now you can have either of two types of Dempster-Dumpsters in the fastest, most efficient and lowest cost method of bulk materials handling ever devised.

IN THIS MODERN, low cost system, one truck-mounted Dempster-Dumpster picks up, hauls and empties, or sets down intact, one loaded detachable Dempster-Dumpster Container after another, regardless of design or size, handling bulk materials of practically every description.

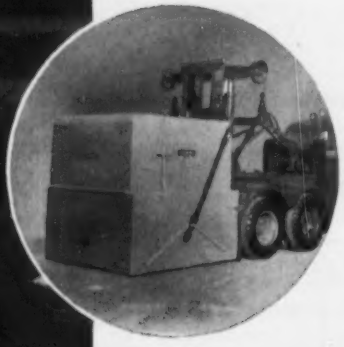
The new Dempster-Dumpster Type DTLF offers several desirable features along with all the economies provided by the Type LFW. These features include: (1) Improved load distribution with container carried in more forward position between wheel centers. (2) Extreme high dumping in cases where it is desired. (3) Vertical pick up of loaded container. (4) Container, loaded or empty, is always in horizontal plane in carrying position. Automatic locking device for positive rigidness of container while in carrying position is, of course, provided.

TREMENDOUS SAVINGS WITH THE DEMPSTER-DUMPSTER SYSTEM HAVE BEEN PROVED BEYOND QUESTION.

One truck-mounted Dempster-Dumpster, operated by only one man, the driver, serves scores of containers of various capacities up to three times greater than the average dump truck. You eliminate trucks standing idle . . . eliminate re-handling of materials . . . eliminate loading crews. You increase efficiency, sanitation and good plant-keeping.

Containers range from 2 to 21 cu. yds. capacity for use with recommended type Dempster-Dumpsters. Each container is designed to suit the materials to be handled—be they trash, rubbish, liquids, dust, bulky, light or heavy. Many leading plants, in almost every type of industry, have found it indispensable after installation. Its proved savings alone justifies an investigation of its potential value in your plant now. Write to us today for complete information. Manufactured and sold exclusively by Dempster Brothers, Inc.

The photo at left illustrates the amazing ability of the Type DTLF Dempster-Dumpster for high dumping. The three photos below show the Pick Up, Haul and Dumping action, hydraulically controlled from cab.



DEMPSTER

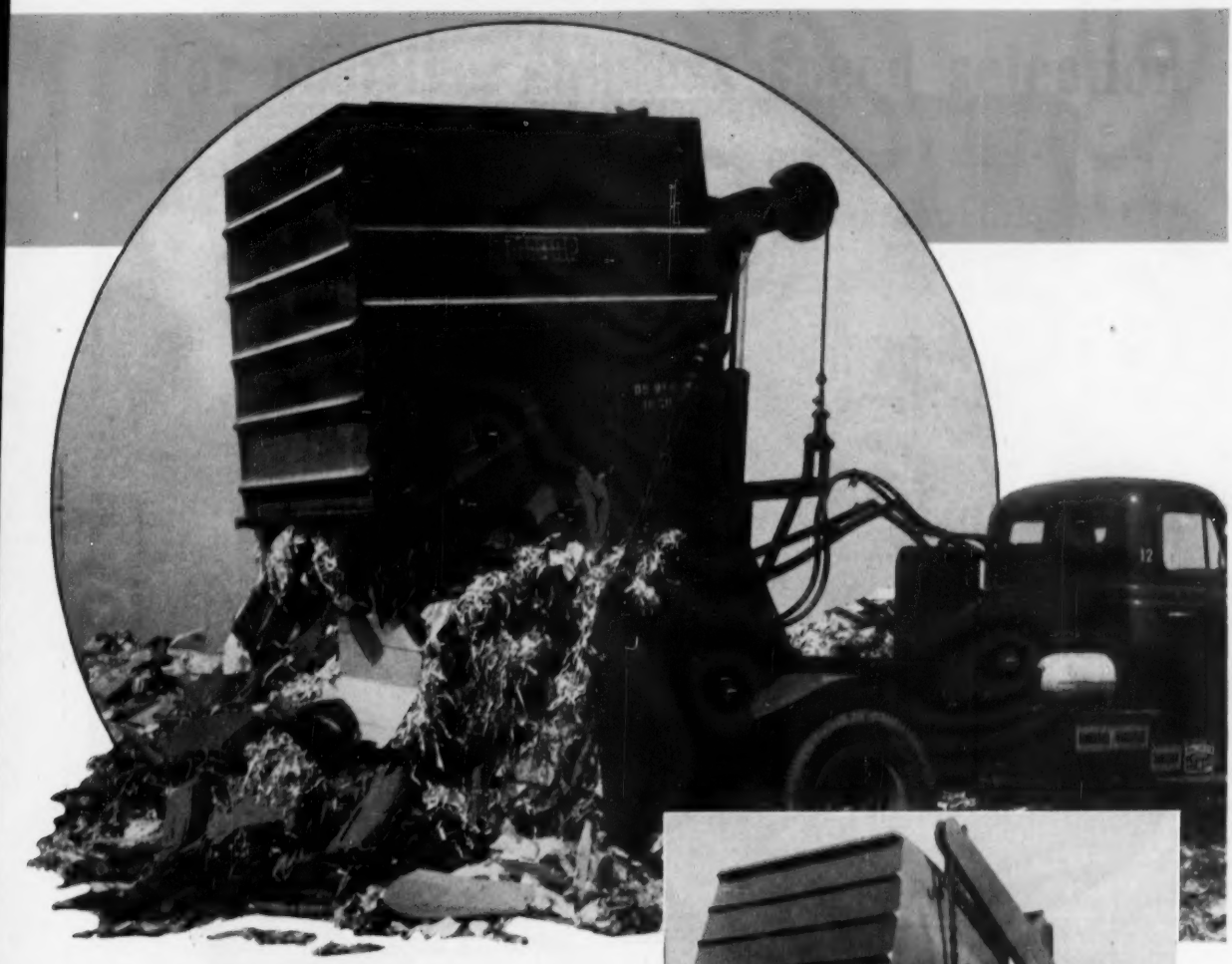
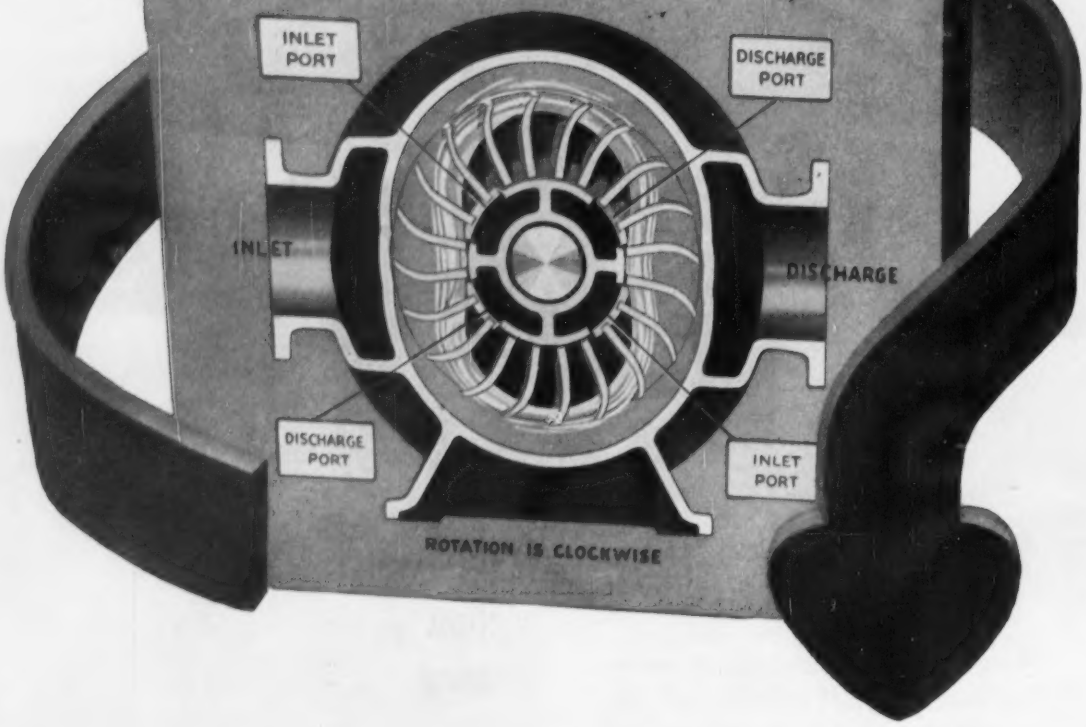


Photo above shows the new Dempster-Dumpster Type DTLF dumping 8 cu. yds. of rubbish. At right you see the Type LFW with load in carrying position. Dempster-Dumpsters are available in capacities capable of handling up to 38,000 pound payloads.

One Truck-Mounted
Dempster-Dumpster Handles Scores
of Containers . . . All Designs . . . All Sizes

B R O T H E R S **725 SHEA BLDG.** **KNOXVILLE 17, TENN.**

Nash Instrument Air Compressors deliver only clean air, free from oil or dust, and without filters



Here is Why!

You can dispense with oil filters and dust filters when you install ®Nash® Clean Air Compressors. You can save the cost of maintaining these devices. You can greatly reduce instrument maintenance costs. For the Nash employs no internal lubrication, therefore no troublesome oil is in the delivered air. Moreover, air from a Nash is thoroughly washed and cooled as it passes thru the pump. Dust in the plant atmosphere, even fly ash, is immediately removed.

®Nash® Clean Air Compressors are simple, with only one moving element. No valves, gears, pistons, sliding vanes, or other enemies of long life and constant performance complicate a Nash. No aftercoolers are needed. You will find it profitable to investigate these pumps, now.

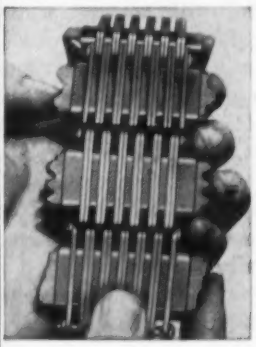
No oil filters.
No dust filters.
No internal lubrication to contaminate air handled.
No internal wearing parts.
No valves, pistons, or vanes.
Non-pulsating pressure.
Original performance constant over a long pump life.
Low maintenance cost.

NASH ENGINEERING COMPANY
395 WILSON, SO. NORWALK, CONN.

For positive, stepless speed selection all industry uses Link-Belt P.I.V.

Here's the inside story

NO SLIPPAGE — HERE'S WHY! Teeth of the radially grooved wheels (above) are cut at a constant depth but are of increasing width toward the wheel periphery. The sides are beveled to provide gripping areas for the self-tooth-forming chain (below). The chain slats shuffle back and forth between the wheels—mesh fully when they engage.



Operates independent of friction from maximum to minimum speeds

FOR speed changing that's completely positive . . . completely stepless—Link-Belt's P.I.V. has no equal. Here's a totally enclosed all-metal variable speed drive that provides exact speed selections—independent of friction.

Following are just a few of the jobs P.I.V. performs with matchless precision:

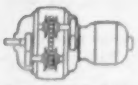
- Exact synchronization of rotating parts and machines
- Accurate control of process speeds
- Precise regulation of rotary motion
- Flexible, accurate timing
- Stepless control of production lines or individual machines

Find out how P.I.V. can extend the useful range of your machine operations. Your Link-Belt office or distributor will give you all the facts. Call today, or write for Book 2274.

4 of 16 P.I.V. types — ½ to 25 hp — ratios to 6:1

Basic P.I.V. Like all others, it is built for horizontal or vertical mounting.

P.I.V. with single reduction input or output helical gears.



Motorized P.I.V. with single reduction input and output helical gears.

Motorized P.I.V. with single reduction input and double reduction output helical gears.

LINK-BELT P.I.V. VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 19,812

For more information, use coupon on last page.

WHY SHOULD THE VITAMIN C CONTENT OF FRUIT AND VEGETABLE JUICES BE STANDARDIZED?

Because nutrition reports disclose that—

- **Vitamin C deficiencies exist throughout the country***
- **Scurvy has not disappeared from the United States***

Proof of deficiencies among adults and children. You should know these facts!* Diet surveys from Maine and Vermont, New York, Illinois, New Mexico, Oregon, West Virginia, and Texas show a definite pattern of inadequate vitamin C intake. These studies covered grade school and high school children, college men and women.

Spongy, swollen gums symptomatic of scurvy.

From these studies* of dietary habits and physical conditions there is considerable proof that many of the children and adults covered by survey have actual, physical symptoms of vitamin C deficiency.

Infantile scurvy. Scurvy* occurs, even today, among infants who are artificially fed. Fortunately the disease may be cured by the administration of vitamin C. How much more sensible it is to prevent it by supplying these bottle-fed infants with the daily allowance of 30 milligrams of vitamin C as recommended by the Food and Nutrition Board of the National Research Council for children under one year of age.

Symptoms of infantile scurvy are fretfulness and fear of being touched.

These bottle-fed infants, unless receiving a pediatric prescription containing vitamin C, are largely dependent on supplemental ascorbic acid which they receive from citrus or tomato juices. Unfortunately, however, these juices may not contain enough vitamin C to supply these babies with needed quantities of this essential element.

Typical position of legs in infantile scurvy.

What can be done? Because of the increasing evidence that American diets are deficient in vitamin C, leading nutrition experts believe that processed fruit and vegetable juices, on which the public is so reliant for its supply of this necessary vitamin, should contain the "Vital Ingredient."

The Vital Ingredient of any processed fruit or vegetable juice is a *dependable* and *adequate* supply of vitamin C. You can give your juice this ingredient by *standardizing its vitamin C content.* The processing is simple and the new low cost of ascorbic acid makes juice standardization more attractive than ever.

With ascorbic acid available *by the tons* at extremely modest cost fruit and vegetable juices can have a standardized vitamin C content for the better protection of the nation's health and well-being.

*Statements are based on documented reports. References on request.

Illustrations after photographs in The Vitamins in Medicine by Bicknell and Prescott, Third Edition, published by Grune & Stratton, Inc., New York.

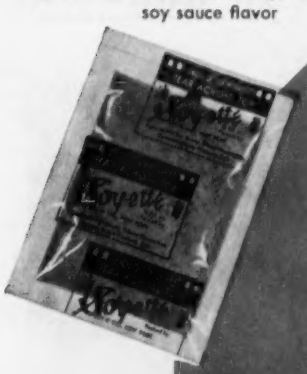
ROCHE Pure, crystalline VITAMIN C
(Ascorbic acid, U. S. P.)

VITAMIN DIVISION • **HOFFMANN-LA ROCHE INC.** • NUTLEY 10, N. J.

In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West, Montreal, Quebec

PACKAGING IDEAS

ODORLESS, TASTELESS, NON-TOXIC PROPERTIES protect soy sauce flavor



CHEMICAL RESISTANCE keeps in pickle juices

GREASE RESISTANCE solves lard seepage problem

made possible by properties of coatings of Du Pont ALATHON polyethylene resin

LOW-TEMPERATURE FLEXIBILITY assures protection of frozen meat

MOISTURE RESISTANCE prevents dehydration of juice concentrate

POSITIVE HEAT-SEAL locks in powdered-dessert flavor

"Alathon" also offers:
STRENGTH, TRANSPARENCY, NON-TACKINESS

*REG. U.S. PAT. OFF.

DU PONT
ALATHON
Polyethylene Resin
BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

Which type of package are you interested in?

- ☐ Multi-wall bags
- ☐ Single-ply bags
- ☐ Pouch bags
- ☐ Board cartons
- ☐ Board trays
- ☐ Fiber drums
- ☐ Corrugated boxes
- ☐ Fiberboard containers

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 542, Du Pont Bldg.
Wilmington 98, Delaware

Please send me information on the properties and advantages of coatings of "Alathon" polyethylene resin.

*Name*_____

*Title*_____

*Company*_____

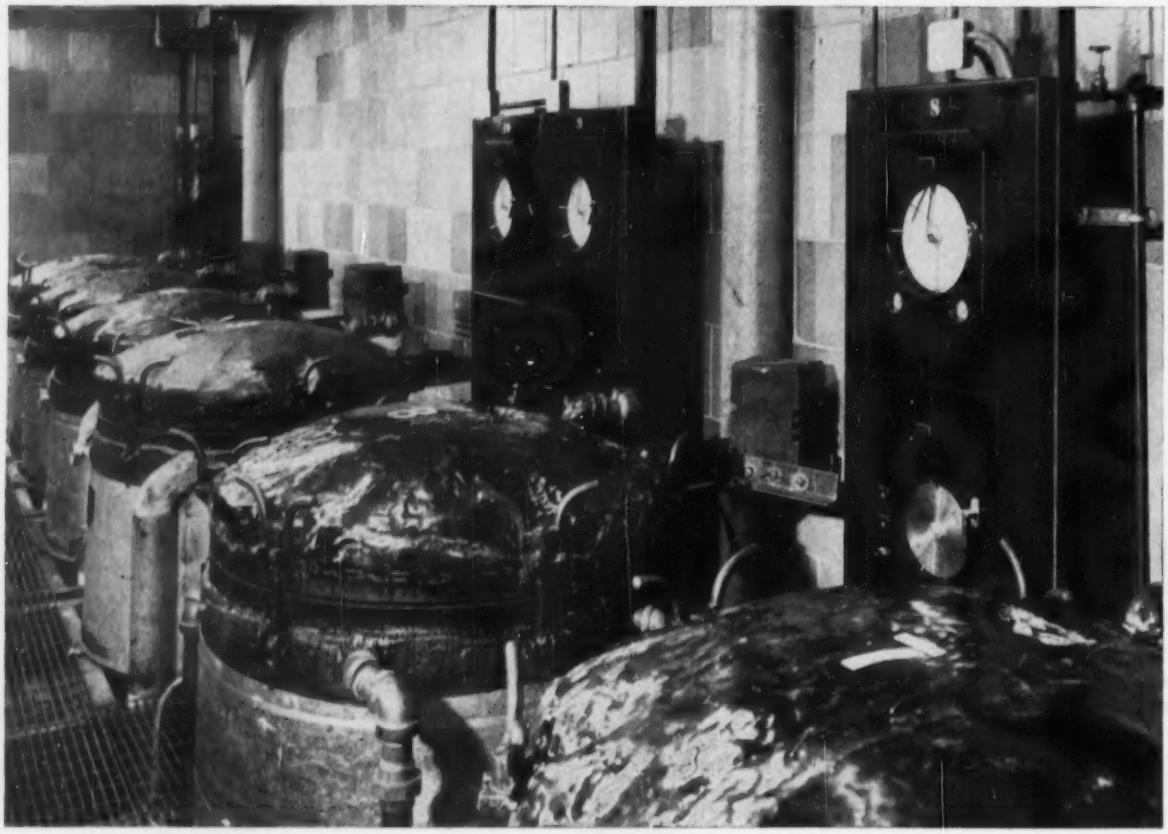
*Address*_____

*City*_____ *State*_____

For more information, use coupon on last page.

ULTIMATE IN

Switch to any product or container in minutes



Part of a battery of new Taylor fully automatic retort control systems in use at a well-known midwestern packing plant.

How the new SWP-7AV Retort System Works

This completely automatic and adaptable retort control system is made possible by the use of the new Taylor FLEX-O-TIMER* Timed-Program Controller, working in conjunction with the time-proven FULSCOPE* Recording Controller.

Instead of a number of individually mounted timers and relays, all auxiliary functions for all forms of retorting are packaged in the Timed-Program Controller.

Operation is simplicity itself. In a typical water-cook requiring pressure cooling, **here's what the operator does:** **1.** Sets the pre-heat temperature and pushes a button; **2.** Loads and locks the retort; **3.** Sets the cook temperature and pushes the start button; **4.** Unloads retort at end of cycle when signal light shows "off".

Here's what the controller does: **1.** Controls temperature during pre-heat period; **2.** Operates agitation air for come-up, cook and cooling periods; **3.** Operates steam, air and overflow valves for temperature and pressure control; **4.** Times the cook period; **5.** Shuts off steam valve, introduces cooling water and maintains pressure on retort; **6.** Cools efficiently on a time and temperature basis; **7.** Shuts off water and air; opens overflow to stop cooling and to release pressure; **8.** Resets for next cycle.

*Reg. U.S. Pat. Off.

ADAPTABILITY

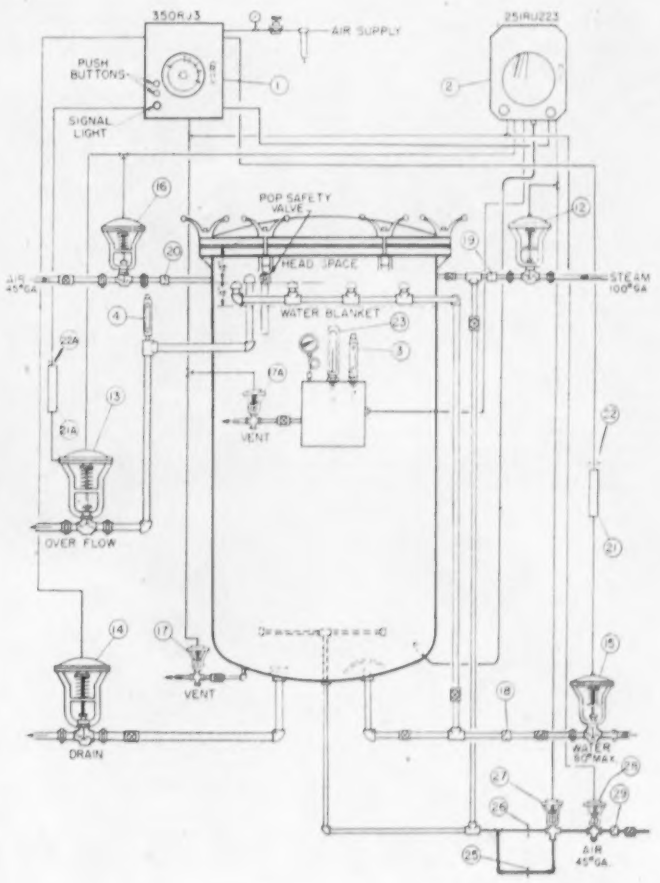
with new Taylor Retort Control System!

THE new Taylor SWP-7AV Retort System gives completely automatic control for either steam or water cooking, with or without pressure cooling. *The system can be changed from one form of cooking to another in minutes. It's readily adaptable to the processing of any existing variety of products and lends itself to exploring the possibilities of other products. It can also be used for any type or size of container.*

The remarkable versatility of this newest Taylor contribution to automatic retorting gives you:

- **Simplicity and economy of installation,** because all the functions are completely packaged, requiring only wiring and piping connections.
- **Maximum production from your equipment investment,** because time lost between product changes is cut to the very minimum.
- **Lowest possible processing costs,** because retorts are used to maximum capacity and efficiency—fast come-up time, no overcooking.
- **Uniformity of product**—each cook is identical because of fully automatic operation.

Here is 30 years of canning control experience wrapped up in a neat package. You'll want to know more about its possibilities for your plant. Your Taylor Field Engineer can enlighten you, or write for **Catalog 500.** Taylor Instrument Companies, Rochester, N.Y., or Toronto, Canada.



Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

See this system demonstrated at the Canners Show... BOOTH No. 20

For more information, use coupon on last page.

King-size Profits!

Sell More, Make More Money with Gleaming Bright
EKCO-FOIL CONTAINER-PACKAGES!

Here are just eight of the 105 shapes and sizes of EKCO-FOIL Container-Packages that we can ship you immediately! Your product *needs Display Attention* and *Quality Protection*. Every product for which an Ekco-Foil Container-Package has been designed is earning increased sales and profits!

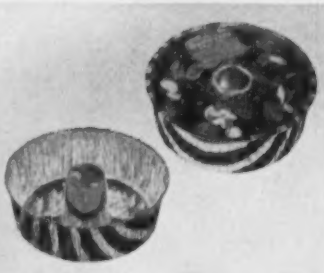
Sells cheese cake mix faster! just right, too, for bakery specialties, carry-out meals and other foods. In three sizes. Vertical, flange, or curled rim.

Perfect for mixed nuts! Also being used to package fresh salads, chili con carne, and even starter plants! Ekco-Foil can be adapted to many food packaging needs.

For ready-to-serve meats or casseroles! Use this gleaming dish for frozen pies and fruit pies, too! No hard-to-clean dishes. No casserole investments and breakage!

In many different sizes! Special sizes available on order. Curled rim. Try just one bakery item in it—watch the better baking, faster sales results!

Chocolate candies score sales records in this pan! Also fried fish fillets, brownie mix, and barbecued beef dinners. It may be just what *your* product needs.



Cakes of All Kinds taste and look best in this Ekco-Foil pan. No transferring from pan, no handling losses. In plain or green and red Ekco-Foil for Christmas cakes. Ideal for cookies and candies, too.

Another one of 105 Ekco-Foil container-packages that add eye appeal and buy appeal! Available with vertical flange for use with covers or curled rim construction.

Creates king-size coffee cake sales! Gives greater eye and flavor appeal to rolls, candies, frozen hors d'oeuvres and many others!

Send Us Your Package!

Let Ekco packaging engineers examine it and make recommendations that can increase *your* profits! Process and sell in Ekco-Foil—the new package-container that makes other packaging old-fashioned by comparison! Call your Ekco salesman or distributor today!

EKCO®

EKCO-FOIL CONTAINER DIVISION
Ekco Products Co., 1949 North Cicero Ave., Chicago 39, Illinois
Also available from Ekco Products Company (Canada) Ltd., Toronto

JENKINS REGRIND-RENEW PLUG TYPE VALVES WITH

500 BRINELL *Armor Seat*

Armored against valve-killing close control of steam . . . and abrasion

Plug and seat ring are Jenkins JX500, a stainless chromium alloy steel made to Jenkins high strength specifications, heat-treated to 500 Brinell hardness. Seating surfaces are super-hard and mirror-smooth, offer highest resistance to galling, cutting, abrasion, and erosion . . . and "wire drawing" effects of close regulation of steam.

300 lb. 200 lb. 150 lb.
Globe and Angle

SOLD THROUGH LEADING DISTRIBUTORS

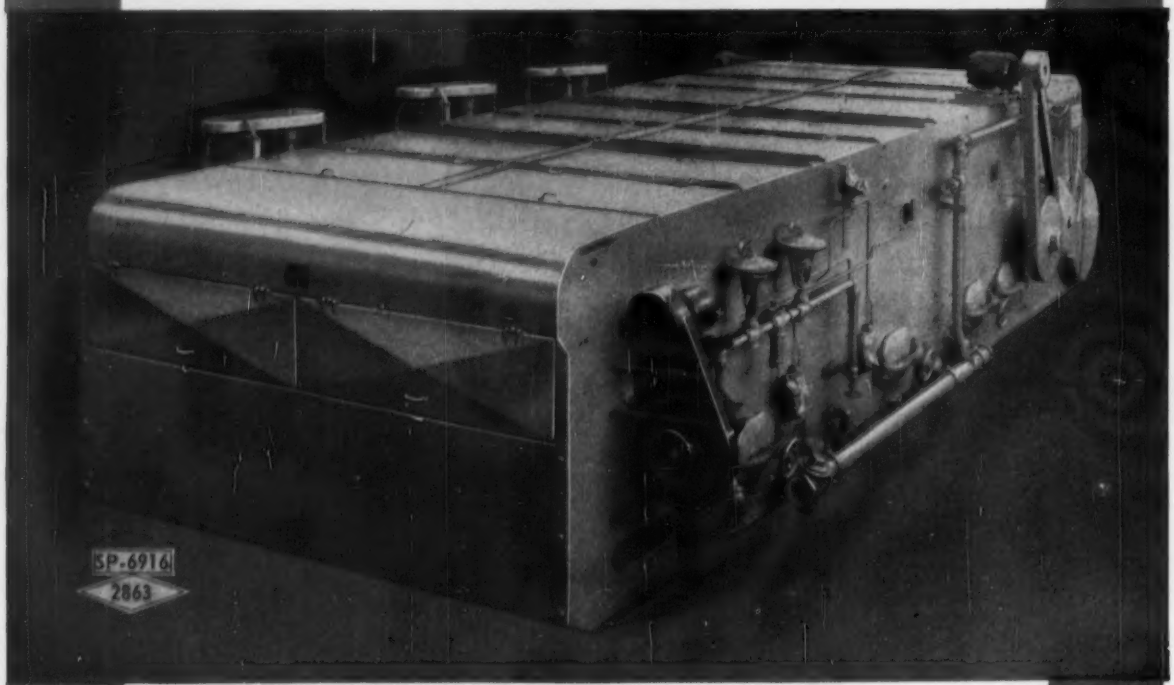
Call your Jenkins Valve Distributor, and ask for Form 202, or write: Jenkins Bros., 100 Park Avenue, New York 17.

JENKINS VALVES

LOOK FOR THE JENKINS DIAMOND

Jenkins Bros

THE MEYER *Cataract* FOOD PROCESS UNIT



for Pasteurizing, Cooling and Exhausting

A MEYER Cataract Food Process Unit is backed by 50 years experience in building efficient bottling equipment including Pasteurizers for the Brewing and other Beverage Industries and processing units for the grape Juice Industry.

The MEYER Cataract Food Process Unit is built for efficient processing. Food products may be cooled, heated or heated and cooled with the MEYER Food Process Unit at very high efficiency. The entire process of heating the product to a pre-determined temperature and/or a subsequent cooling, is accomplished within a single unit. It has proved highly efficient in a wide variety of applications, since 1939.

Designed to minimum floor space, feed at one end, discharge at the other end; also built in Multier design where floor space is limited.

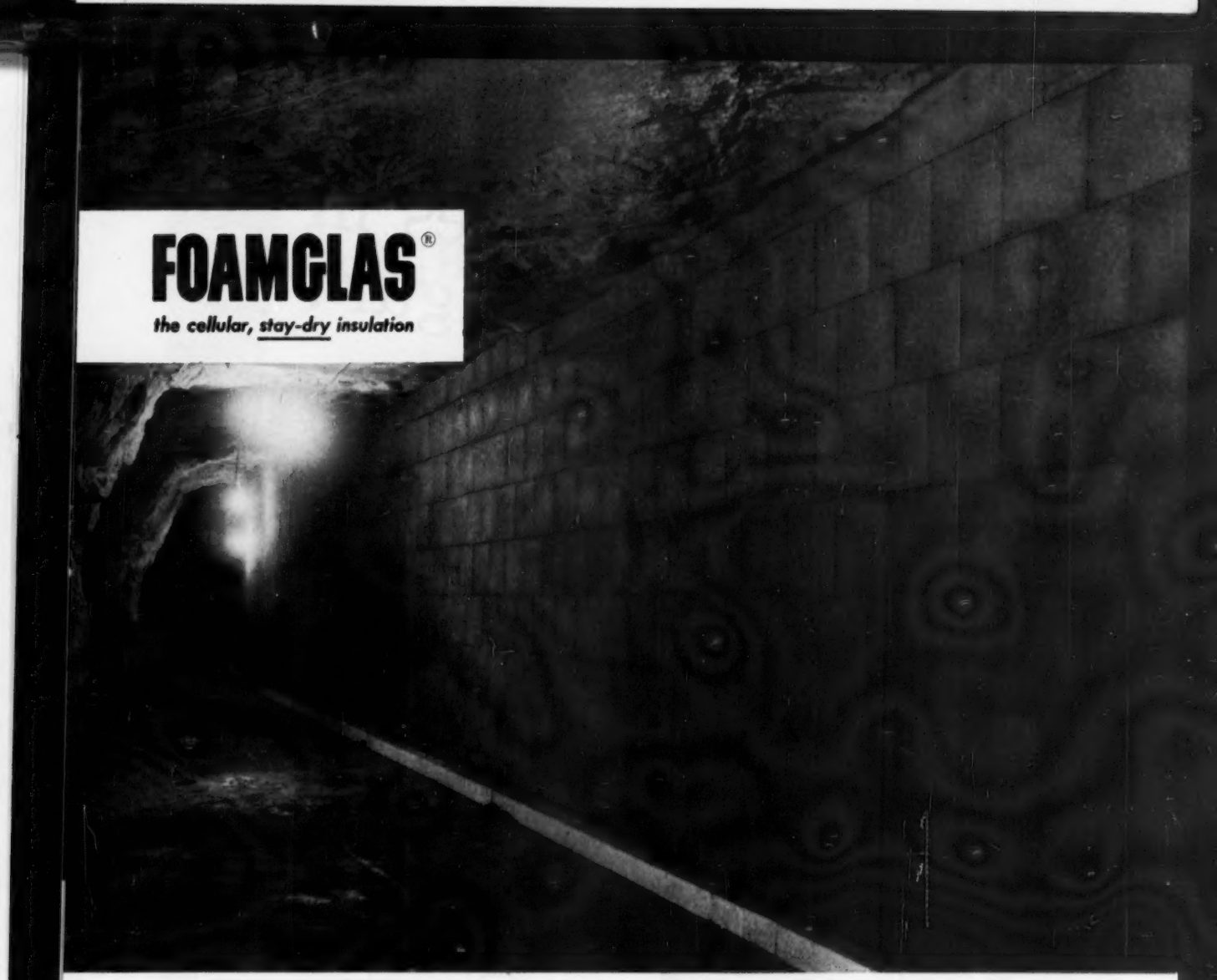
The entire cooling or heating or heating and cooling operates on a continuous basis, under mechanical control. Product handling, waste water and labor requirements are minimized. Sanitary design provides for quick cleaning and visual inspection of all surfaces contacting the product packaged.

The MEYER Cataract Food Process Unit is designed for products in any and most forms of the prevailing size of glass or tin containers, likely to be adopted, from any diameter to 12½" high and particularly where one unit is to handle all types. Provisions can be made to handle containers of larger heights. Tell us of your requirements.

USED THE WORLD OVER — Dumore — BOTTLING EQUIPMENT

50

GEO. J. MEYER MANUFACTURING CO.
CUDAHY, WISCONSIN



FOAMGLAS®

the cellular, stay-dry insulation

Underground quarry's 2,500-carload freezers stay dry because FOAMGLAS is moisture-proof

In a nine-acre *underground* limestone quarry below a 175 ft. overburden, Inland Cold Storage Company, Kansas City, Kansas, can store 2,500 carloads of frozen foods! "Our cave was a natural for this," Inland President Leonard H. Strauss points out. "A year-round temperature of 55°F cut in half our costs for refrigeration and construction. With naturally insulated ceilings and floors, only walls were needed to complete our 16 storage rooms.

"We had one tough problem. Although this is a 'dry cave,' on a hot, humid day the relative humidity inside the undeveloped area may reach 85%. But this moist air won't get into any of our freezers or coolers because their walls are insulated with moisture-proof FOAMGLAS. It's the one insulation that'll stay constantly efficient, making refrigeration failure a minor problem. We'd lose only two or three degrees in our zero degree rooms with a complete refrigeration breakdown for two weeks."

You can benefit too from the unique properties of this waterproof, strong, vermin-proof insulation. Please write today for our booklets with complete technical and specification data for cold storage insulation.

Pittsburgh Corning Corporation

Department O-25, One Gateway Center
Pittsburgh 22, Pennsylvania

In Canada: 57 Bloor St. W., Toronto, Ontario

450,000 bd. ft. of FOAMGLAS was very easy to install . . . five inches thick on walls between the rooms and six inches, double coursed on perimeter walls. 15,000 ft. of FOAMGLAS pipe insulation was applied later to brine lines held at 24° below zero. General Contractor was Winn-Senter Construction Co., Kansas City, Mo.; Insulation Contractor was Kelly Asbestos Products Co., Kansas City, Mo.

How many calories in a spoonful of sugar?

200 ☐ 100 ☐ 50 ☐ 18 ☐

Some guess as high as 600, but
the right answer is only
18 calories in a level teaspoonful

If you are counting calories,
this fact is even more important—

Sugar can help you cut down on
the number of calories you eat

Research findings show how raising your blood sugar level helps keep your appetite—and weight—under control

People who go on diets are usually surprised to find out that there are only 18 calories in a teaspoonful of sugar.

That's the number of calories an average adult uses up in about 7½ minutes of normal activity!

But this is just one of the reasons why most people are able to enjoy sugar and still maintain the weight they want.

Sugar raises the blood sugar level faster than does any other food. And the blood sugar level is part of the healthy body's own weight control system.

Helps regulate appetite

Research scientists, looking for the reason why some people overeat (and get fat), found a relationship between the blood sugar level and the size of the appetite.

When your blood sugar level is *low*, your appetite is bigger. You just naturally tend to eat more. Sometimes *too much*.

When it is elevated, appetite is smaller. You are more quickly satisfied on smaller portions. You find it much easier to say "no thanks" to the extra helpings that lead to extra pounds.

These studies also showed that substances which have no effect on the blood sugar level (such as non-caloric artificial sweeteners) were not effective in reducing the number of total calories actually eaten.

Any help from them is mostly in the mind instead of in the waistline.

More realistic approach to dieting

Overcoming that hollow, always hungry feeling has always been one of the hardest parts of dieting. That's why many of the newer diets now include sugar in foods and beverages to help keep appetites satisfied on less food.

These diets often start a meal with a sweetened fruit juice or fruit cup to help bring your appetite down to size.

They allow a light snack or refreshing beverage in mid-morning and late afternoon to help keep hunger from *building up*.

They permit simple desserts because they make a small meal so much more satisfying.

So isn't it good to know that sugar helps to "count your calories" for you?

SUGAR INFORMATION, INC.
Box 137, New York 5, N. Y.

All facts in this message apply to both beet and cane sugar.

MORE AD POWER ALL THROUGH '55...

Reader's Digest, Time and **Sports Illustrated** have been added to the list of publications carrying the sugar industry's advertising messages. List also includes **Life, The Saturday Evening Post, New Yorker,** and **NEWSPAPERS** blanketing America's 34 top population and marketing areas.

Here's How Sugar's Advertising Helps Sales of

Your Product

Reassuring reports of scientific facts reinforce people's natural preference for sugar-containing foods and beverages

Even though all good foods and beverages contain calories, many people have been led to believe that anything that contains calories is fattening.

This dangerous myth could adversely affect the health of large numbers of people, as well as the health of your own industry. If allowed to spread, it could undermine the wholesome attitudes toward their products that food manufacturers and bottlers have built up over the years.

That's why the sugar industry is reporting well-to-remember facts like these:

- There is *no such thing* as a fattening food. The only kind of calories that can make you fat are the ones that come from overeating.
- Sugar, and many other foods, contain *far fewer calories* than most people think.
- People who already weigh about what they should (and there are 4/5 of our total population who are not overweight) *can go right on enjoying all their favorite foods and beverages without fear of getting fat.*
- People who are overweight need not cut out any food—they should simply *cut down.* And sugar can make it *easier* for them to cut down.

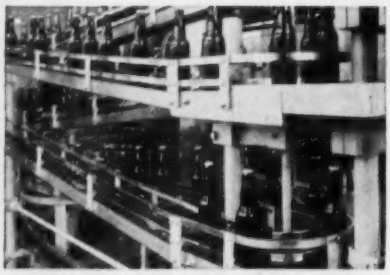
This advertising is the kind that takes the long-range view. It is intended to do a job that is just as important as today's sales. That is to strengthen the favorable attitudes that people must have for your product if sales are to have stability and growth.

SUGAR INFORMATION, INC.
New York 5, N. Y.

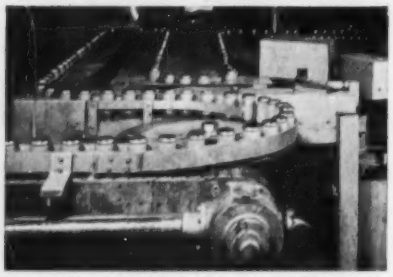
For more information, use coupon on last page.

For smooth, economical conveying-- carry it on Link-Belt flat-top chain

EASY-TO-CLEAN Link-Belt S-815 flat-top chain conveyor moves baby food jars smoothly during careful inspection at this Michigan plant.



VERTICAL OR HORIZONTAL CURVES offer no problem for universal crescent flat-top chain.



SMOOTH HANDLING is assured as RC flat-top chain carries jars through filling and capping operations.

Choose from many types of LINK-BELT carrying chain

WHETHER you're handling baby food or beverages—cartons or cans—there's *one* chain in the complete Link-Belt line that will meet your exact needs. The chains pictured above, for example, are only three of many types of Link-Belt flat-top chain.

Link-Belt also builds a variety of cast, combination, forged and fabricated steel chains. They're available with a wide range of attachments for specialized services.

As for drive chain on your food handling machinery, Link-Belt offers an equally broad range of types, including roller and silent chain. High or low speeds . . . heavy shock loads or moderate duty—you'll find the right answer in Link-Belt chain.

There are Link-Belt offices in every principal industrial area. Call the one near you for an impartial analysis of your drive or conveying chain needs.

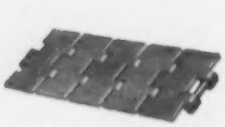
LINK-BELT

CHAINS and SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

13.690

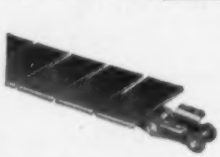
No one chain serves every purpose . . . get the RIGHT one from Link-Belt's complete line



S-815 flat-top conveyor chain—economical, sturdy, reliable, easy to detach and to keep clean.

Class RC universal crescent flat-top chain for multi-plane operation in a variety of paths.

Class RC crescent flat-top chain—travels in horizontal planes and around corners.



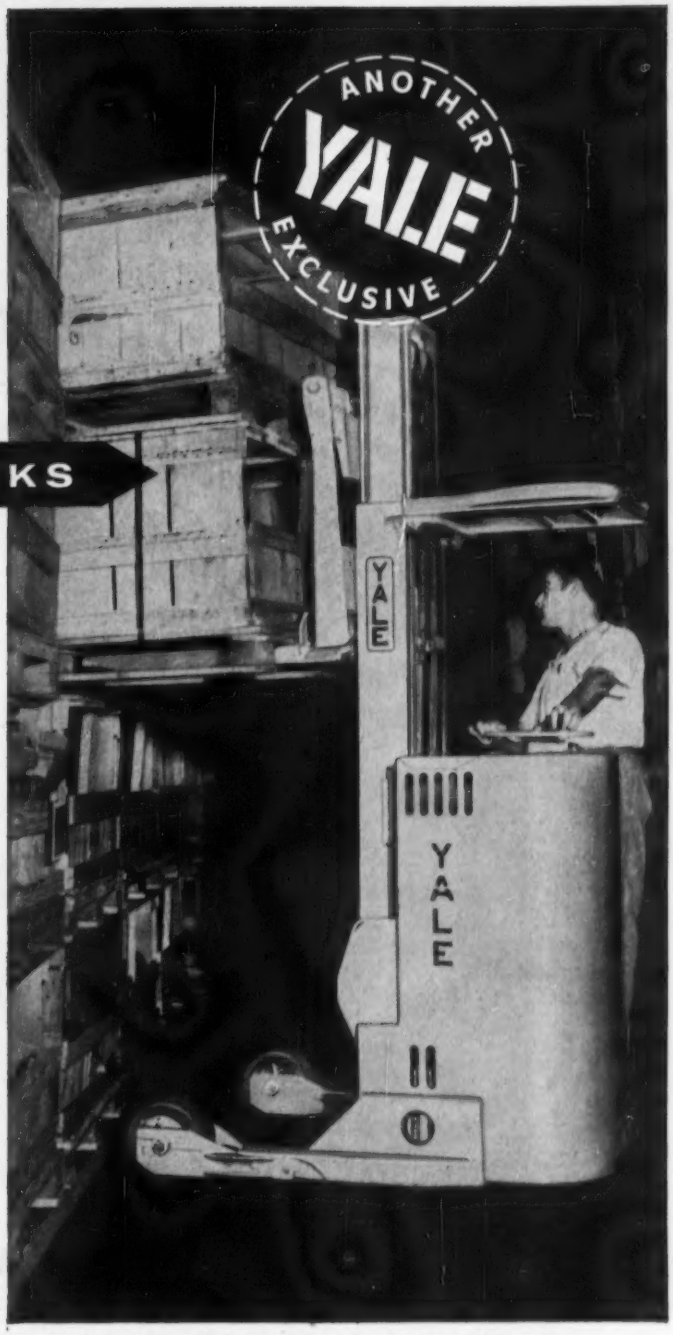
Class RC flat-top chain—precision made for smoothest, spill-free carrying and long life.

Class 400 swivel chain—carries cartons, cases, etc. over paths with both vertical and horizontal turns.

New Yale Warehouser

equipped with

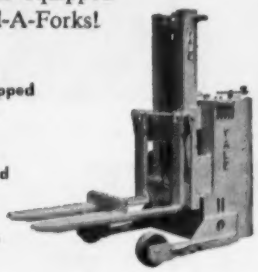
EXTEND-A-FORKS



Load positioned on new Yale Warehouser. A push of control button operates the Extend-A-Forks...load slides easily and smoothly into place.

Same famous high lift and speed of operation...with great new space-saving feature!

This new YALE Warehouser has all the time-and-space-saving features of the full YALE Warehouser line—but with an important new difference! Exclusive Extend-A-Forks save more space than ever —*reach out* with a full 20-inch stroke to pick up loads... *pull back* to carry loads tucked in and tilted for efficient, narrow-aisle operation. Only YALE offers you this cost-saving extra... in a 2,000 or 3,000 lb. capacity truck with so many big truck features. If you've been looking for a way to cut warehousing costs, write for full information on the new YALE Warehouser equipped with exclusive Extend-A-Forks!



New YALE Warehouser equipped with Extend-A-Forks. Short coupled length. Full-rated for 2000 and 3000 lbs. Excellent visibility. One-hand control of lifting, lowering and driving. Lift to 126 in. For indoor and outdoor use.

YALE*

INDUSTRIAL LIFT TRUCKS AND HOISTS

*Reg. U. S. Pat. Off.

GAS, ELECTRIC, DIESEL & LP-GAS INDUSTRIAL TRUCKS
WORKSAVERS • WAREHOUSERS
HAND TRUCKS • HAND & ELECTRIC HOISTS

MAIL THIS COUPON TODAY

The YALE & TOWNE Manufacturing Co., Dept. 462
Roosevelt Blvd. & Haldeman Ave., Phila. 15, Pa.

☐ Please send more information about the new YALE Warehouser with "Extend-A-Forks."
☐ Please have your local Representative call.

Company_____
Name_____ Title_____
Street_____ City_____ State_____

In Canada write:
The Yale & Towne Manufacturing Co., St. Catharines, Ont.

For more information, use coupon on last page.

PFIZER SODIUM CITRATE

Pfizer Sodium Citrate controls the body and texture of your process cheeses. It prevents that grainy, mealy consistency...makes possible easy, non-crumbling slicing. These mouth-watering, sales-building qualities are good reasons for switching to Pfizer Sodium Citrate now.

Manufacturing Chemists for Over 100 Years

Pfizer

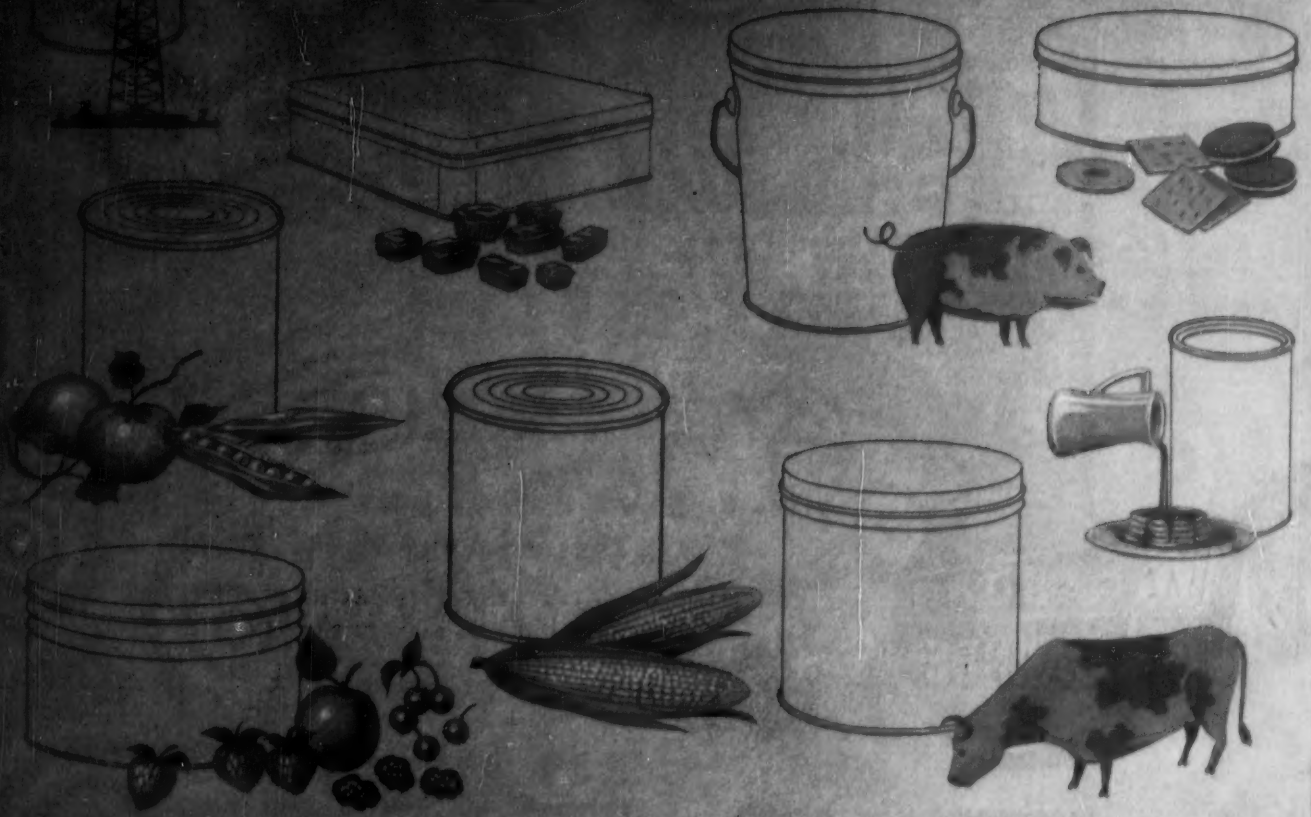
CHAS. PFIZER & CO., INC.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.

ONLY HEEKIN CANS ARE *PRODUCT PLANNED*...

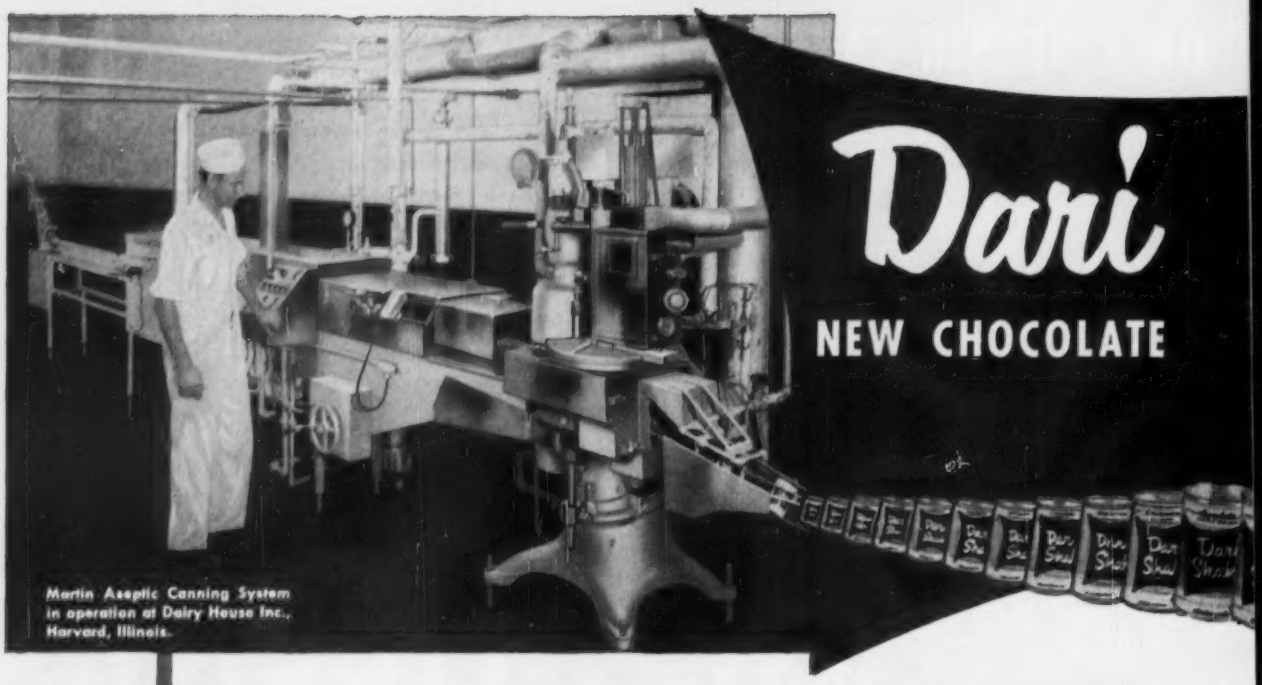
THROUGH extensive research by chemists, engineers and market research studies, Heekin has prefected methods that will best meet your problems in metal packaging. *Heekin Product Planned Cans* PLUS Heekin Personal Service is the *best buy* in metal packaging. Call Heekin . . . Profit by Heekin's fifty-four years of can manufacturing experience. Heekin Cans . . . *plain or lithographed* . . . are Product Planned . . . Planned for YOUR profits. Let us work with you.

HEEKIN CANS

PRODUCT PLANNED

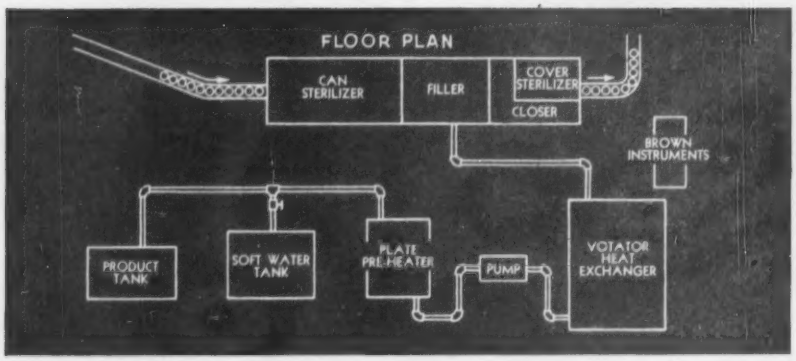


THE HEEKIN CAN CO. *PLANTS AT CINCINNATI & NORWOOD, OHIO; CHESTNUT HILL, TENNESSEE; SPRINGDALE, ARKANSAS*



Martin Aseptic Canning System in operation at Dairy House Inc., Harvard, Illinois.

NOW PROCESSED WITH



Floor plan showing arrangement of Martin Aseptic Canning System . . . a continuous canning process that automatically fills and seals sterile products in sterile containers in a sterile atmosphere.

W. F. & John Barnes are Exclusive Sales and Service Representatives for the James Dole Engineering Co., Manufacturers of the Martin Aseptic Canning System

W. F. & JOHN BARNES COMPANY

PROCESS EQUIPMENT DIVISION

407 SOUTH WATER STREET • ROCKFORD, ILLINOIS

West Coast Representative BARMOTIVE PRODUCTS, Inc.
440 Peralta Avenue, San Leandro, California, *Technical Sales and Service*

W. F. & JOHN BARNES

BUILDERS OF BETTER MACHINES

MARTIN ASEPTIC CANNING SYSTEM

At Dairy House Inc., a subsidiary of the Bowman Dairy Company and Bowey's Inc., the Martin Aseptic Canning System is today processing Dari Shake, a delicious chocolate drink, with all the original flavor, color, texture, and nutritive value preserved. Previously, Dari Shake, one of a number of heat sensitive products, could not be canned by conventional methods. Now, with the Martin Aseptic Canning System, tests by Dairy House technologists have proven that the uniformity, flavor, and stability of the chocolate drink is excellent. The Model 60 Martin Aseptic Canning System, illustrated at left, produces 35,000, 8-oz. cans of Dari Shake on a typical 10-hour production run.

A Continuous Canning Process

In operation, the chocolate drink is quickly heated to a temperature of 290° F., held for a few seconds to insure sterility, and is rapidly cooled to 40° F. in a closed heat exchange system. The cans are sterilized in the Martin Unit and then conveyed through the can sterilizer to the filler, ready to receive the cold sterile product. After the cans are filled, they are conveyed in a sterile atmosphere to a closing machine where they receive sterile covers from the cover sterilizer. A slight positive pressure is maintained in the Martin Equipment so that outward flow of sterile gases acts as an efficient contamination barrier. The Martin Aseptic Canning System has now been in operation at Dairy House since 1951 with excellent results. For one 3-month period, it was kept running on a production basis of 24 hours a day, 7 days a week . . . further proof of the dependability of the Martin Aseptic Canning System.

ADDITIONAL DATA

New brochure describes in detail the advantages of canning with the Martin Aseptic Canning System. The Martin System is available in 5 sizes with capacities up to 300 consumer-size cans per minute. Write for your free copy today.

Empty Glass Single Filers

Carton Uncasers and Recasers

Retort Basket Loaders and Unloaders

Special Conveyors and Elevators

AND EQUIPMENT SINCE 1872

For more information, use coupon on last page.

How come an old-line camera manufacturer stirs up the shortening business like that?

Meet the new *Kodak Stereo Camera*. A modest $84.50, plunked down on any of umpty-ump thousand camera counters, makes it all yours. You can then take glorious Kodachrome pictures in three glorious dimensions even if you haven't made a snapshot since your 12th birthday.

Thus for the past 67 years the general public has known us—the people who made the snapshot as much a part of family life as the kitchen table.

To keep the millions of snapshooters snapshooting, we got involved in such by-paths of research as how to pack film to withstand the tropics. The scientist working on that question wanted to pump air out better than it had ever been pumped out before, so he invented some new vacuum pumps. Then, sort of forgetting why he had started, he looked around for interesting things to do in a super-vacuum. It didn't take long (only nine years or so) to figure out how to put oily materials in such a vacuum, heat them in a thin film, and condense the vapor on a near-by cooler surface. This resulted in sorting out the constituents of the oil, molecule by molecule. After a while, we learned how to do it by the tank car in equipment that bore no resemblance to laboratory glassware.

One of the things we tried in the molecular stills was the mono-diglyceride emulsifier that had come into the fat business in the early '30s. We found that the process separated out the active mono from the inactive esters, the free glycerine, the catalyst, the taste, and the color. It concentrated the "shortening improving" effect in the distillate. We marketed the distillate under the trade-mark "Myverol."

Even after recognizing the efficacy and purity of the distilled monoglycerides, it took us and the shortening industry about four years to choose the right varieties for each application and evaluate them by commercial use. The realization that Myverol monoglycerides will actually save money while doing an efficient job of emulsification seems to have hit large segments of the industry at the same time. We welcome the rising excitement, for our stills can handle even more than they are at present. To join the party, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies and Company, Los Angeles and San Francisco • Charles Albert Smith Limited, Montreal and Toronto.

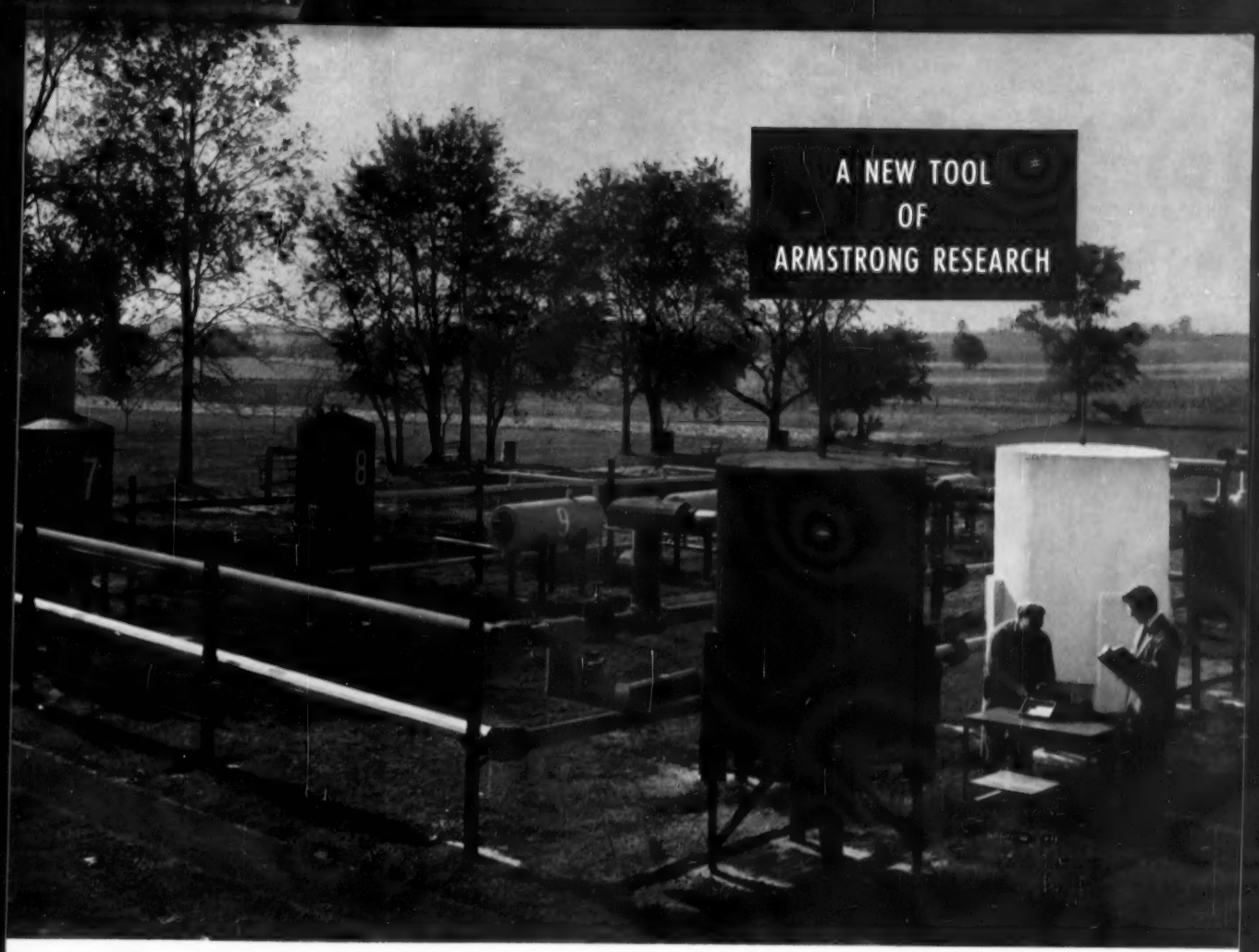
distillers of monoglycerides made from natural fats and oils

DPi

Also... vitamins A and E

Distillation Products Industries *is a division of* **Eastman Kodak Company**

Camera price quoted includes Federal Tax and is subject to change without notice.



Tank Farm • • • *ideas grow into insulation specifications at this unique testing unit*

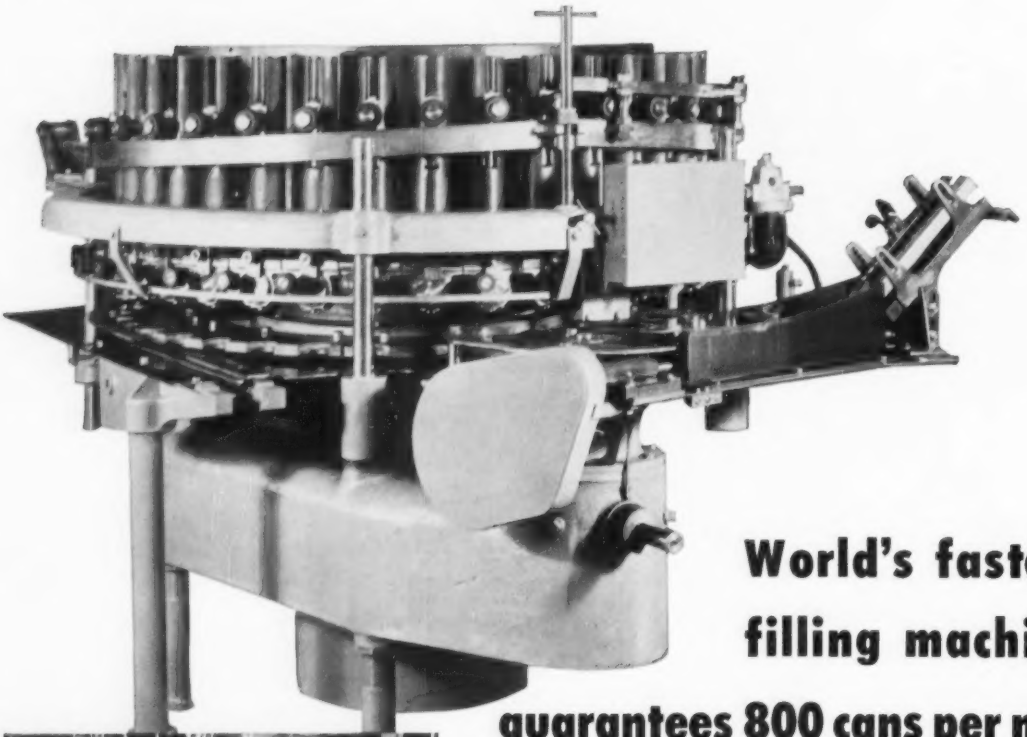
To study scientifically the effects of weather on insulations and protective finishes, Armstrong recently built a unique outdoor Tank Farm. Here, new and old insulation specifications and materials are evaluated under field operating conditions. Both high and low temperatures are held in a variety of pressurized, commercial and domestic oil tanks, and in a wide assortment of pipe lines.

The Tank Farm's equipment is extremely flexible so that insulation can be applied by one method and, if desired, replaced at any time to meet a completely different specification. Tests indicate which materials and methods warrant further development to replace current specifications.

This Tank Farm is but one example of how Armstrong Research is constantly working to improve industrial insulation materials and to develop simpler, more economical specifications. For full details on the Armstrong Line of industrial insulations and complete Contract Service, call your nearest Armstrong office or write Armstrong Cork Company, 206 Stratton St., Lancaster, Pennsylvania.

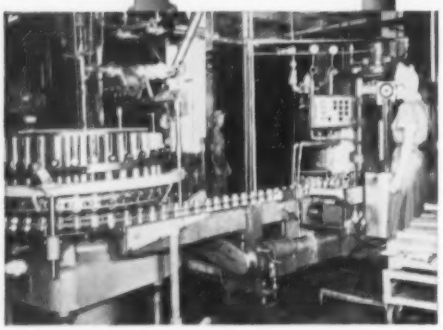
Study of new insulations, finishes, and methods of applying them is a continuous program of Armstrong Research. A new specification for applying corkboard is being made ready for testing on this experimental low-temperature tank.

Armstrong INDUSTRIAL INSULATIONS



World's fastest filling machine guarantees 800 cans per minute

New Pfaudler 35 Station Piston Filler!



More than 800 cans of baby food a minute are filled at H. J. Heinz Co., Leamington, Ontario, with this new Pfaudler 35 station filler. Filler, world's fastest, was developed at Heinz's request by The Pfaudler Co. with cooperation of Continental Can Co.

On a single machine, you can fill a container of your product for every man, woman and child in a city the size of Riverside, California (population 46,764)—in less than 1 hour!

That gives you some idea of the production advantages of the new Pfaudler 35 piston filler. It's the world's fastest. We *guarantee* it will fill 800 cans per minute, in all sizes up to 16 oz. And we've seen it go higher than 1000!

Breath-taking production speeds on the new Pfaudler 35 are easily regulated with these special features:

Magnetic brake stops the filler within .2 second after you apply it, and is synchronized with a similar high-speed brake on the closing machine.

Electrically controlled no-can-no-fill mechanism is activated pneumatically for split-second spill prevention.

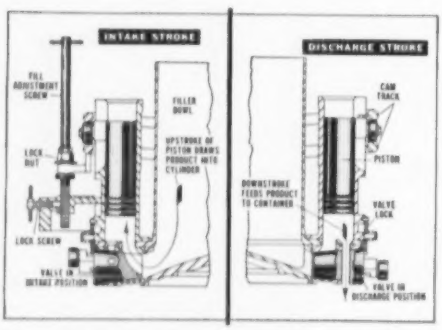
Adjustable tilt—Cans ride on a track which tilts them for filling. Angle of tilt adjusts to speed of filling and product.

Precise filling—In most cases, we can guarantee an accurate fill within $\pm 1/10$ oz.

Maintenance of the machine is simple. You have only 3 points on the entire filler to lubricate by hand. Bearings in the base and all gears are automatically lubricated. Cleaning is also easy, because only the valves and pistons need be removed, and you don't need any tools to do the job.

Challenge us

Make us prove to you that the Pfaudler 35 will actually pay for itself in lower production costs, higher production. Write for our latest bulletin today.



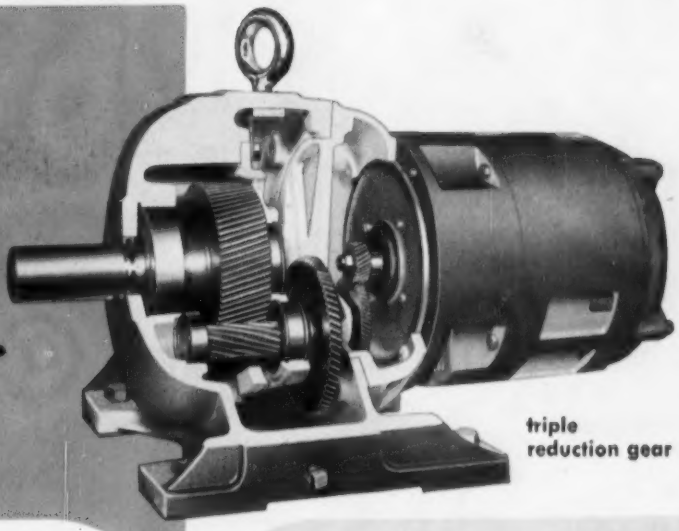
Filling action is illustrated above. The diagrams show position of operating parts on opposite sides of the machine.

See it operating at the NATIONAL CANNER'S SHOW IN CHICAGO!

THE PFAUDLER CO., ROCHESTER 3, N.Y.

Now...

Simplify Your Motor Drives... and Save!



triple reduction gear

Here's

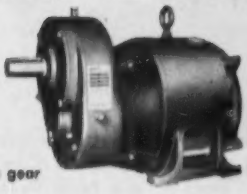
BUILT-IN SPEED... To Fit Your Need

with a complete, new line of

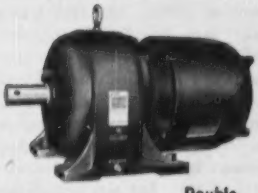
Century

Gearmotors

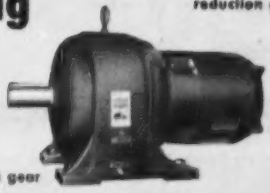
equipped with *Duti-Rated* Precision Gearing



Single reduction gear



Double reduction gear



Triple reduction gear

Now you can profit by the advantages of more compact, safer and simpler motor power transmissions... with rugged Century GEARMOTORS to match the operating speed of your equipment.

This new Century line offers a wider-than-ever choice of:

- **BUILT-IN SPEEDS**
- **MOTOR OPERATING CHARACTERISTICS**
- **FRAME PROTECTION**
- **HORSEPOWER RATINGS**... 1 to 15 h.p. with Duti-Rated Precision Gearing... and fractional gearmotors from ⅛ to ¾ h.p. are also available. Larger ratings can be furnished if required.

Century C MOTORS

CENTURY ELECTRIC COMPANY
1806 Pine Street, St. Louis 3, Mo.
Offices and Stockpoints in Principal Cities

820

FOR COMPLETE INFORMATION...mail this coupon today:

CENTURY ELECTRIC CO.
1806 Pine Street, St. Louis 3, Mo.

Please send Bulletin

☐ Bulletin 4-1p21 ⅛ to ¾ H.P.

☐ Bulletin 4-1p31 1 to 15 H.P.

To:

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

For more information, use coupon on last page.

E. A. Hamann (left), Power Generation Engineer and Robert Best (right), Superintendent of Utilities, go over lubrication records with Bill Schall, Standard Oil lubrication specialist. Bill Schall has been providing technical sales service to Standard Oil customers since 1943. Bill is an engineer with a B.S. in engineering from Georgia Tech., and a graduate of Standard's Sales Engineering School. Customers of Bill's find this experience and background pay off *for them.*

Anheuser-Busch still using same turbine oil after 24 years

...NONPAREIL

For more than 24 years the Anheuser Busch Brewery, St. Louis, Mo., has been operating two 3,000 kw., turbines using NONPAREIL Turbine Oil. Three more turbines added to the system in 1940, '48 and '51 have also used NONPAREIL since beginning operations. The reason for choosing NONPAREIL is clear; it is guaranteed for the life of the turbine.

Since the initial installation, Anheuser Busch has not had to replace a NONPAREIL Turbine Oil fill. Neutralization number is always far below 0.15 mg. KOH/g., the degree of acidity Standard Oil guarantees NONPAREIL will not exceed. At nearly all times neutralization number is on the order of 0.03 mg. KOH/g. (See chart).

In all these years, oil systems have remained clean. There has been no problem of oil acidity in any of the five turbines. The delicate art of brewing world famous Budweiser goes on without concern over power failure due to lubrication failure.

Like to know more about NONPAREIL and its possible use in your turbines? In the midwest call your nearby Standard Oil lubrication specialist. Or, contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Anheuser-Busch Turbine Lubrication Record

Generator Capacity	Start up and NONPAREIL Installation Date	Date of Last Oil Analysis	Neutralization Number
3,000 kw.	Oct. 2, 1930	July 20, 1954	0.03
3,000 kw.	Oct. 2, 1930	July 22, 1954	0.02
2,500 kw.	June 10, 1940	July 20, 1954	0.03
7,500 kw.	Jan. 2, 1948	July 22, 1954	0.03
7,500 kw.	July 26, 1951	July 22, 1954	0.01

STANDARD

STANDARD OIL COMPANY
(Indiana)

SWIFT'S PICK-UP GUMS SERVE EVERY LABELING NEED

Whether you're labeling at 35° or 150°, on terne plate, tin cans or glass . . . at 100, 200 or 400 cans per minute—*Swift's* new label is news for *your* labeling requirements.

Built for speed, Swift's new, improved Hot Pick-Up Gums are resin-based for instant grab . . . come in convenient chunk form for quick, uniform melt down and easy use. From Grade C (cold cans) to WR (wide-range), there's a grade to meet your canning temperature and speed requirements.

As smooth machining as they are versatile, Swift's Pick-Up Gums do not string or build up. They're strong on tack, non-foaming and *long* in mileage economy.

Remember, too, that Swift's adhesives and glue products serve packing and packaging needs in all phases of the food industry. From labeling to shipping, to *easy* opening, the name *Swift* means quality, service and dependability.

SWIFT's Lap End Pastes. Fast machining, quick, strong tack—for a wide variety of label stocks. Rust inhibited, water resistant, and resins for difficult surfaces.

SWIFT's Easy-Open case sealer. No opening tools required . . . tug breaks the seal.

SWIFT's Evertite glass labeling adhesives. Three grades serve wide range of machining and label stock requirements. Write today for the new bulletin on Swift's quality canning adhesives.

Swift
1855 CENTENNIAL 1955
TO SERVE INDUSTRY BETTER

USE THIS COUPON FOR FURTHER INFORMATION

SWIFT & COMPANY, A-8
Adhesive Products Dept.
4115 Packers Ave., Chicago 9, Ill.

Please send further information on the following products:

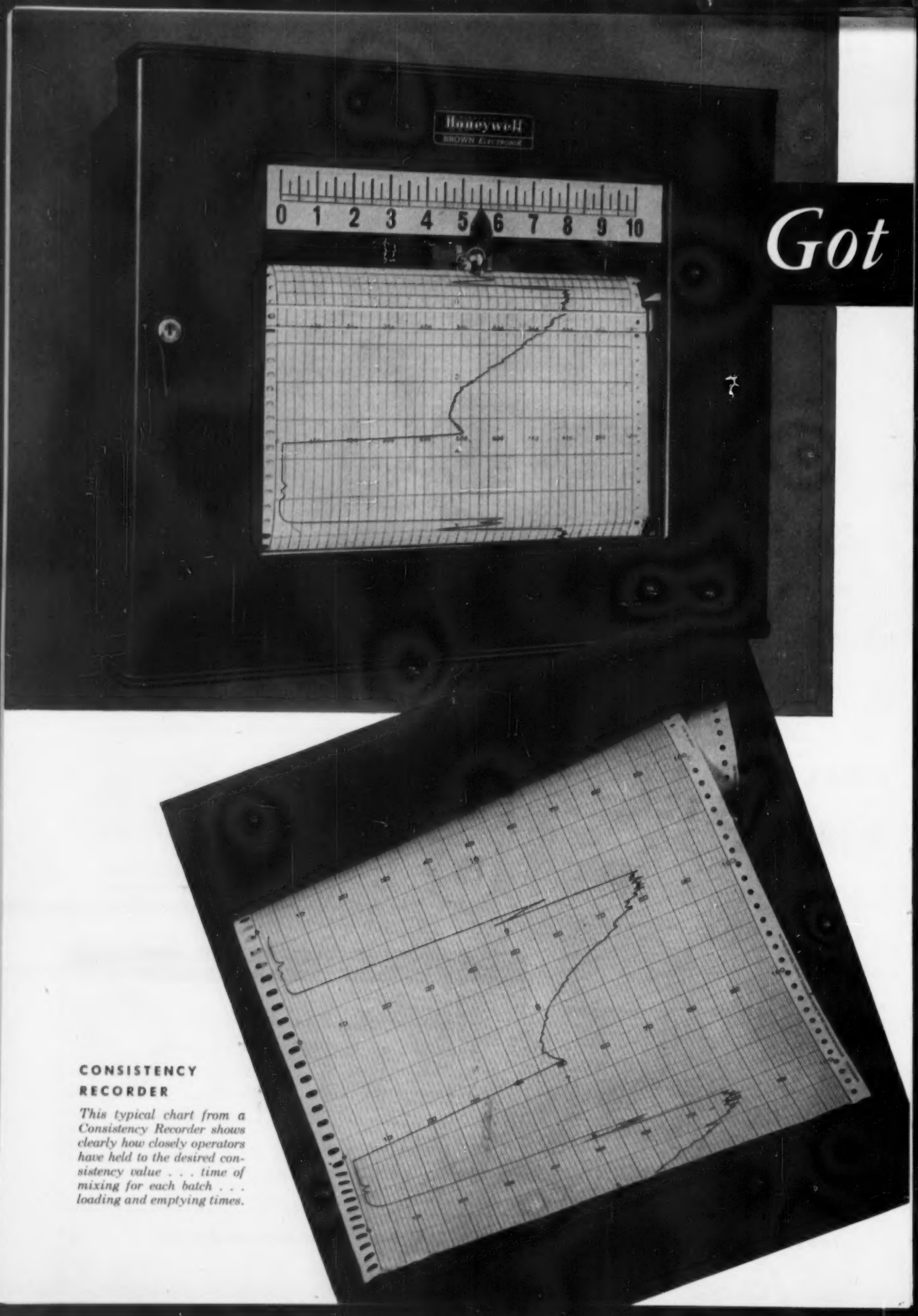
☐ HOT PICK-UP GUMS ☐ EASY OPEN CASE SEALER
☐ LAP END PASTES ☐ EVERTITE

Company _____

Address _____

City _____ *Zone* _____ *State* _____

Your name _____



Got

CONSISTENCY RECORDER

This typical chart from a Consistency Recorder shows clearly how closely operators have held to the desired consistency value . . . time of mixing for each batch . . . loading and emptying times.

a mixing process?

here's an accurate, sensitive way to measure consistency

THIS unique idea in control may prove useful to you any time you have a problem of mixing a product to desired consistency. It's the *ElectroniK* Mixture Consistency Recorder, which continuously measures and records the consistency of the material you're working.

This instrument uses a novel but extremely simple principle. It measures the electric power required to drive the mixing machine's motor. When the consistency of the product increases, the drag on the motor increases . . . and so does the power taken by the motor. Motor input is thus related directly to product consistency.

Direct measurements of consistency are not only non-continuous, but also difficult and uncertain. The *ElectroniK* Consistency Recorder, however, *affords* a sensitive, readily reproducible qualitative index to this important variable. It gives the machine operator a reliable guide for supervising the mixing process . . . shows up abnormal variations, and tells him when processing is completed. And it provides management with detailed production chart that points out intervals between batches, shutdowns, loading and emptying times.

Instrumentation consists of a specially designed *ElectroniK* strip chart potentiometer, which works in conjunction with a Thermal Converter Unit. Both are rugged, precision-made components which have been used for years in other industrial measurement and control applications.

Your local Honeywell sales engineer will be glad to discuss how you can apply this instrumentation to your own mixing machines. Call him today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Avenues, Philadelphia 44, Pa.

● **REFERENCE DATA:** Write for Data Sheet No. 3.6-7

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS

H HONEYWELL

First in Controls

From Farm

Bulk Milk Pick-Up

from farms is now handled in many areas by modern White 3000 tank trucks. This tandem unit operated by Dairy Co-Op Ass'n. Milk Transport handles big payload yet affords excellent maneuverability and driving ease.

to Store

Now Schrafft's Deliveries

of ice cream go by White 3000 with efficient, big-payload walk-in type body. Serving Schrafft's Manhattan retail outlets and other stores, short wheelbase and overall length are important in heavy traffic. The 2200 gallon body has full door in rear, aisle for loading and side compartment door. It doubles payload, saves delivery time because of low-level body design.

DAIRY INDUSTRY

steps up service with WHITE 3000

Here are just two of many wonderful examples of White 3000 efficiency and economy in the dairy industry. Everywhere, this modern motor truck is pointing the way to substantial savings because the White 3000 is engineered to exact operating needs and it's quality built to save more . . . longer.

Why not ask your White Representative to show you the profitable advantages of streamlining your fleet this modern way with the White 3000?

THE WHITE MOTOR COMPANY
Cleveland 1, Ohio

FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

IMITATION
RASPBERRY
by FIRMENICH

gives finer flavor...
greater sales appeal...
to your products

You get the direct and authentic reproduction of raspberries in their full perfection in Raspberry Flavor by Firmenich. For Firmenich took fully ripe raspberries, freshly severed from the stem, captured their delicate and fugitive flavor, and by original research reconstructed it in all its significant and desirable components. Firmenich Raspberry comes to you as a precise and potent flavor material of the utmost purity and stability to enhance the flavor of your products and to make them more attractive to your customers.

FIRMENICH & CIE
SUCCESSEURS DE
CHUIT, NAEF & CIE.
GENEVE SUISSE

FIRMENICH INCORPORATED

250 WEST 18th STREET, NEW YORK 11, N. Y.
CHICAGO OFFICE: 612 NORTH MICHIGAN AVE.
FIRMENICH OF CANADA, LIMITED, 348 WALLACE AVE. - TORONTO
GENEVA - PARIS - LONDON

Big new oil presses run smoother with TIMKEN® bearings taking heavy thrust loads

THESE big French Oil Mill Machinery Company presses produce vegetable oil at high production rates in a Southern oil mill. A feed screw and discharge screw are used to extract the oil from the cottonseed.

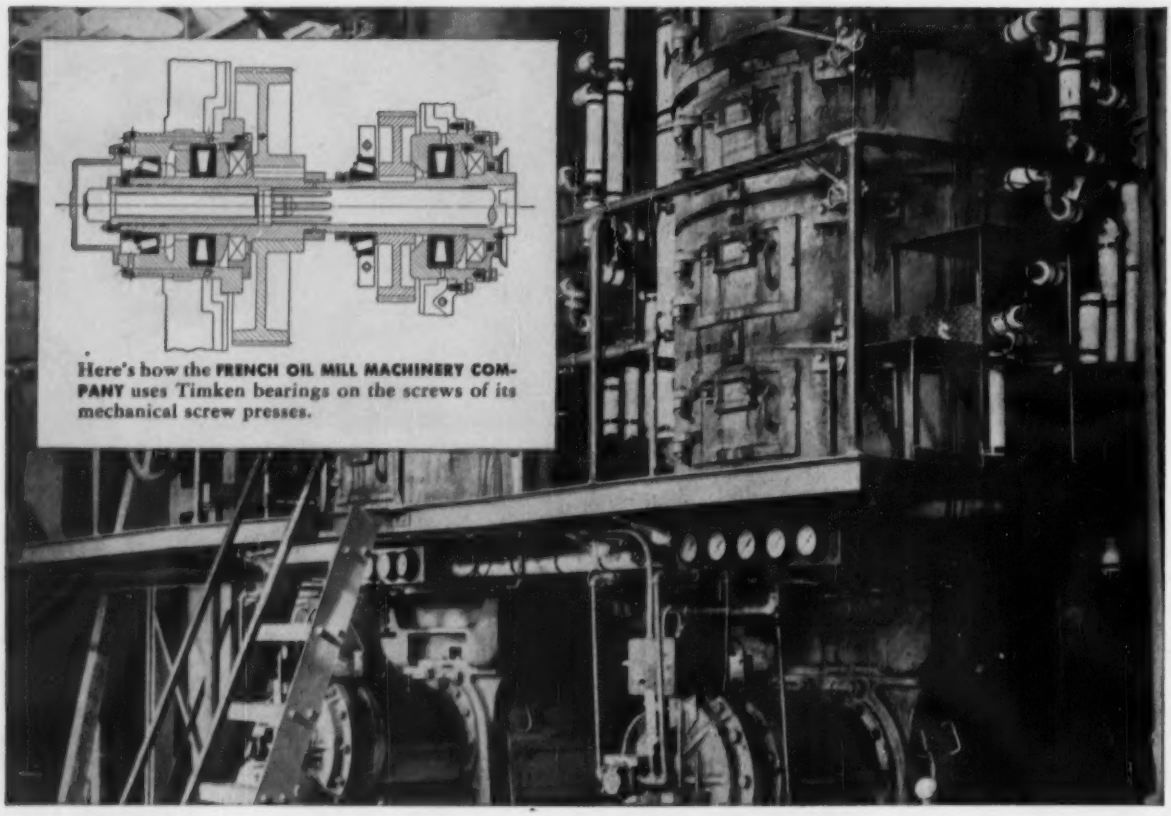
The action of the screw results in heavy thrust loads. Ordinary thrust collars would set up too much friction, so the French Company uses two Timken® on-apex tapered roller thrust bearings.

Timken bearings eliminate metal-to-metal rubbing action and cut friction way down. They *roll* the load. As a result, presses run smoother, last longer, require less maintenance.

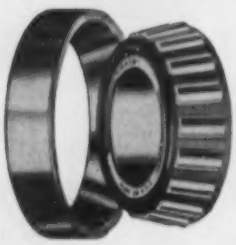
The French Company also uses Timken tapered roller bearings in the drive of this mechanical screw press to insure accurate gear mesh and a smooth flow of power. Line contact between rollers and races gives Timken bearings extra load carrying capacity assuring longer life with trouble-free performance. And, made of Timken fine alloy steel, they're case hardened to give a tough, shock-resistant core and a hard, wear-resistant surface.

Timken bearings are a sure sign of quality on the equipment you buy, the equipment you build. Always look for the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



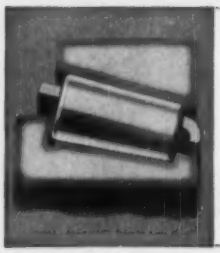
Here's how the **FRENCH OIL MILL MACHINERY COMPANY** uses Timken bearings on the screws of its mechanical screw presses.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▱ BEARING TAKES RADIAL ◫ AND THRUST →◫← LOADS OR ANY COMBINATION →◫←

"It's like waxing your floors with a film of plastic"

NEW
SUPER
WESTWAX
contains
MIRITE®
PLASTIC
EMULSION

WHEN you apply new SUPER WESTWAX it's just like laying down a protective sheet of tough, transparent plastic on your floors. With NEW SUPER WESTWAX you get
— brilliant gloss
— extra durability
— freedom from discoloration
— easier maintenance

Why? Because this heavy-duty formulation contains —
West's crystal clear Plastic Emulsion, MIRITE®
and
prime #1 yellow Carnauba Wax.

IT combines all the features of the finest floor protection in a single wax:
— dries to a hard, mirror gloss
— resists scuffing from traffic
— resists water
— requires no polishing

And SUPER WESTWAX is slip resistant — meets Underwriters' Laboratories requirements for floor treatment materials.

OLDEST AND LARGEST COMPANY OF ITS KIND IN THE WORLD

LET a West floor expert demonstrate SUPER WESTWAX on your own floor — show you how easy it is to use. No obligation, of course. Just send the coupon.

WEST DISINFECTING Company

WEST DISINFECTING COMPANY Dept. S
42-16 West Street, Long Island City 1, N. Y. *(Branches in principal cities)*
In Canada: 5621-23 Casgrain Ave., Montreal

☐ I'd like a free copy of your folder on SUPER WESTWAX.
☐ I'd like to have a WEST representative telephone me for an appointment.

Name_____

Position_____

(Tear out this coupon and mail it with your letterhead)

Shopping for refrigeration?

THERMO KING

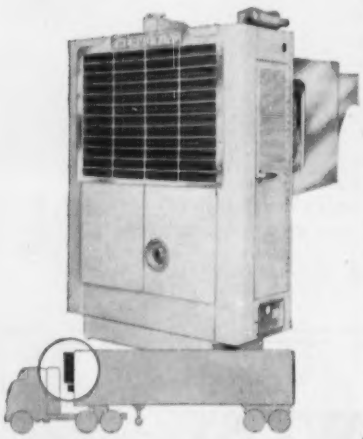
Delivers

MORE COLD

for your **CASH**

Your truck refrigeration dollar buys more real—not theoretical—cooling capacity when you buy THERMO KING. 20 years of experience guarantee that THERMO KING will give you the most refrigeration for your money. Your best buy is THERMO KING.

New THERMO KING "pancake" model fits the new cab-over-engine tractor and longer trailer trend in trucking.

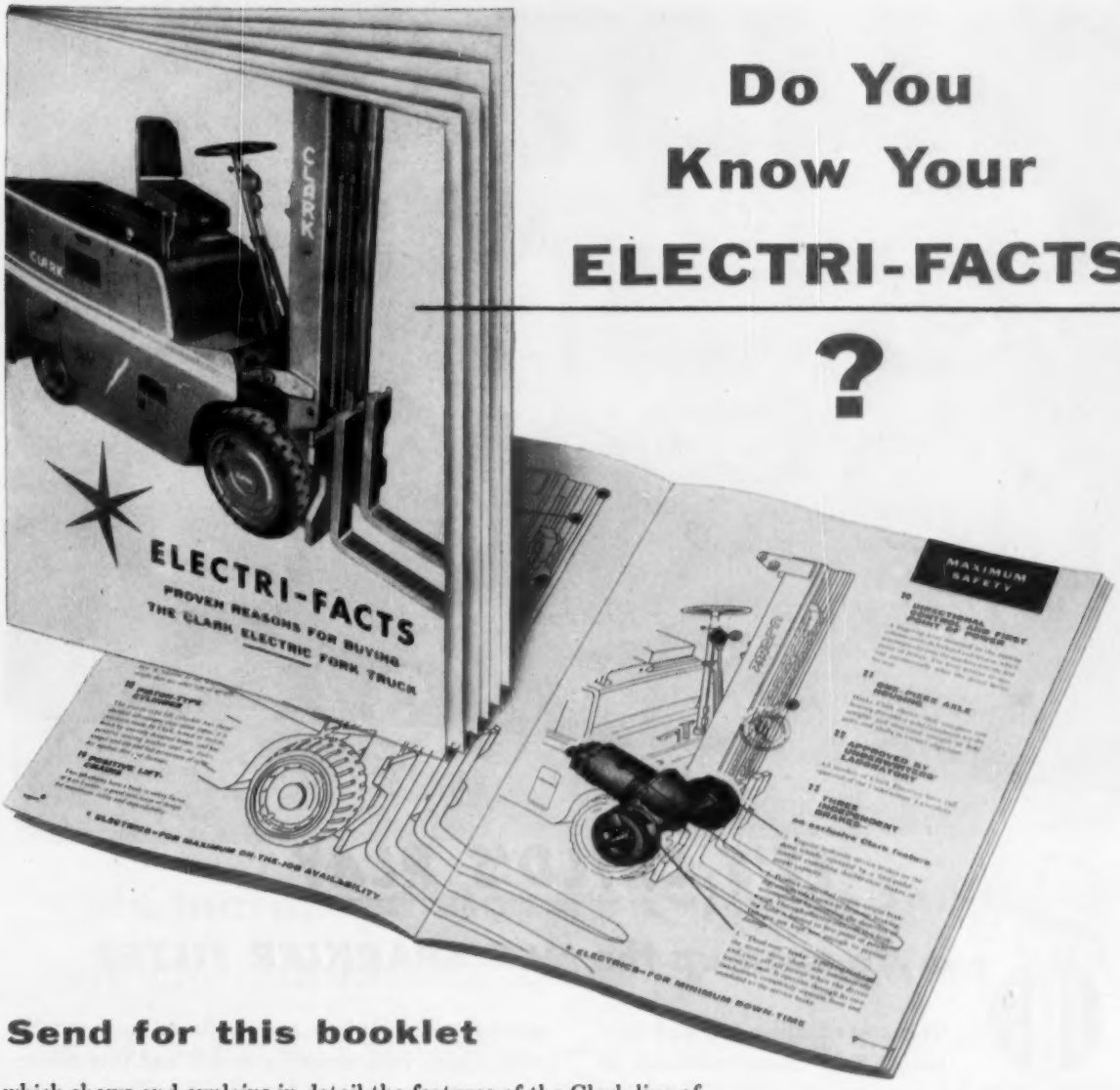


U.S. THERMO CONTROL CO.

44 South 12th Street
Minneapolis 3, Minnesota

Authorized service and genuine parts—from coast to coast!

Do You Know Your ELECTRI-FACTS ?



Send for this booklet

which shows and explains in detail the features of the Clark line of electric-powered lift trucks. The Electri-Facts Booklet disassembles the Clark electric truck to give you a mechanic's-eye view of all working parts—electrical control system, hydraulic system, power train, uprights, brakes, etc. Find out why Clark electrics give you better battery efficiency, why they operate a longer work-cycle than any other electric truck. Before you buy an electric truck, or any lift truck, you owe it to yourself to have the facts on Clark electrics. Use the coupon—send for your copy of ELECTRI-FACTS.

CLARK EQUIPMENT

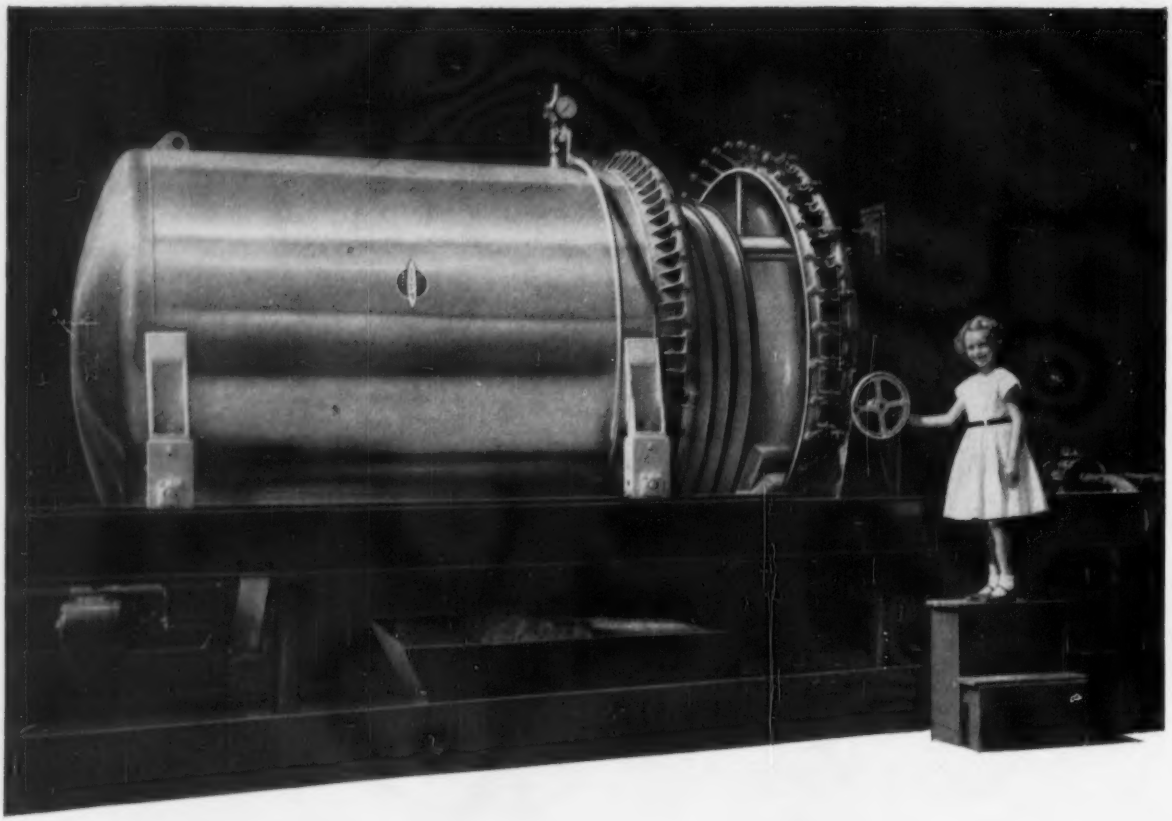
Industrial Truck Division · CLARK EQUIPMENT COMPANY · Battle Creek 14, Michigan

☐ Send ELECTRI-FACTS

Name_____ Firm_____

Address_____ City_____ Zone____ State_____

For more information, use coupon on last page.



IT'S CHILD'S PLAY

...to open up the MCR SPARKLER FILTER

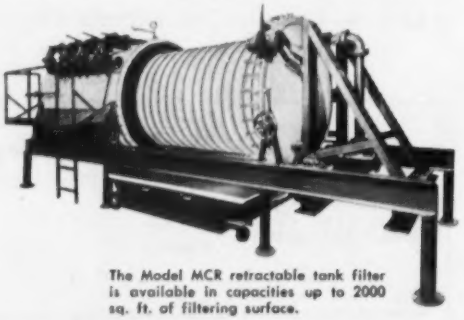
TOP HAT QUALITY

The most effortless operated filter made. Talk about economy in operation; the labor and time saved alone in opening, cleaning and closing the MCR gives a running start in cost saving that puts you out ahead of manual operated filters. There is no labor problem with the MCR; operators love this filter.

Whether you are filtering heavy chemicals, primary filtration of beer, heavy oils, or any product with a high bulk residue you will find this power operated aristocrat of heavy duty filters faster, easier, and more efficient at every step in the filtering operation.

No breaking of pipe connections—self sealing cover gasket—complete drainage—smooth power retraction of the tank—are advanced, operating features that put this new filter in a class by itself.

Write Mr. Eric Anderson for engineering details of this filter as applied to your particular filtering problem.



The Model MCR retractable tank filter is available in capacities up to 2000 sq. ft. of filtering surface.

SPARKLER MANUFACTURING CO.

MUNDELEIN, ILL. • Sparkler International Ltd. • Plants at, Galt, Ontario, Canada; Amsterdam, Holland.

For over a quarter of a century, engineers and manufacturers of a complete line of industrial filtration equipment.

"We increased storage capacity one-third, cut car-unloading time by more than 50% with Clark Trucks," says JOSEPH PALESE, PLANT SUPERINTENDENT, SALERNO-MEGOWEN BISCUIT CO., CHICAGO

In this Salerno bakery, one of the world's largest, you find four Clark electric fork trucks and three Clark Powrworker hand trucks—unloading and storing raw materials and handling palletized cartons ready for shipment.

Practically all material received from local suppliers —bags of flour and sugar, drums of oil and shortening, other items in boxes, sacks, rolls—is loaded on pallets manufactured by Salerno, and furnished by them to suppliers. The busy Clarks take over at the receiving doors, and handle materials throughout the full production cycle. Benefits are substantial: a 33% increase in storage capacity and car-unloading time cut by well over 50 per cent.

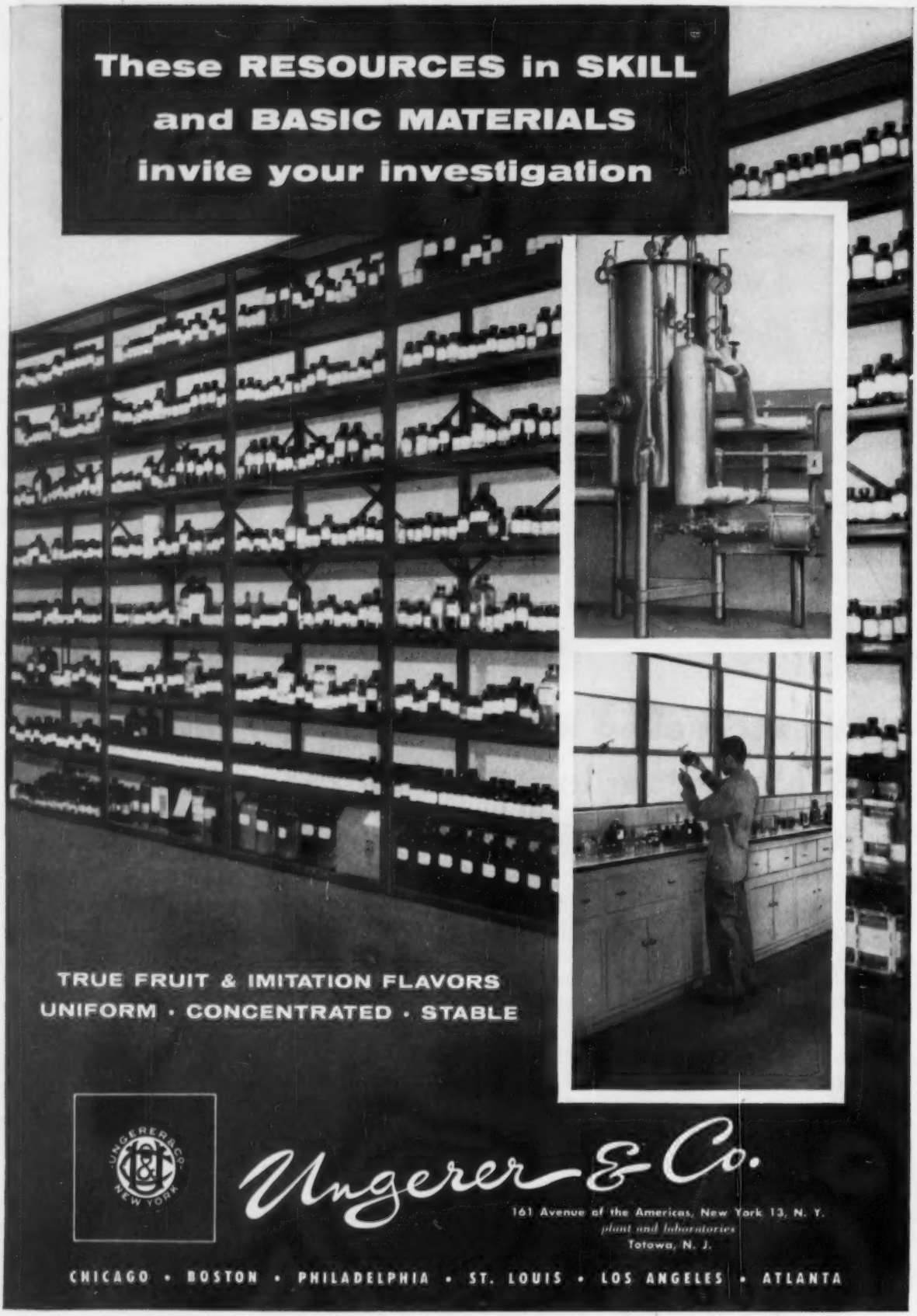
"We are completely satisfied with our Clark machines, and have three more on order," says Mr. Palese.

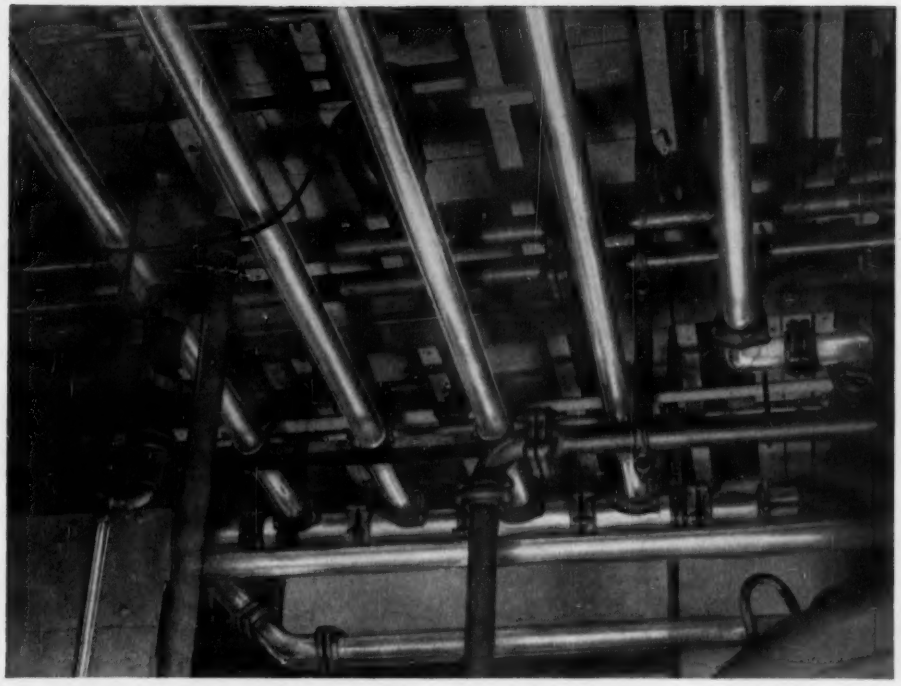
These benefits can be yours—simply call your local Clark dealer, listed in the Yellow Pages of your phone book: a good man to help engineer a handling system to meet your needs.

CLARK EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 14, Michigan

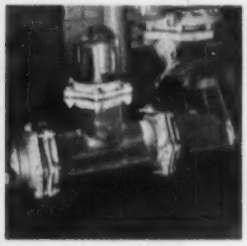
For more information, use coupon on last page.


These RESOURCES in SKILL
and BASIC MATERIALS
invite your investigation
TRUE FRUIT & IMITATION FLAVORS
UNIFORM · CONCENTRATED · STABLE
UNGERER & CO. NEW YORK
Ungerer & Co.
161 Avenue of the Americas, New York 13, N. Y.
plant and laboratories
Totowa, N. J.
CHICAGO · BOSTON · PHILADELPHIA · ST. LOUIS · LOS ANGELES · ATLANTA



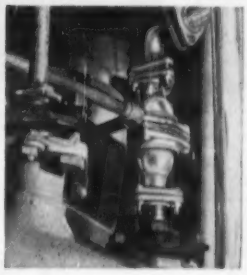
Vinegar and salt solutions can be highly corrosive—and corrosion can affect sanitation. But this PYREX pipe manifold system transporting mustard and other condiments from mill manufacturing to glass-lined storage tanks will never corrode. Never will it need replacement. Connection with tanks and pipes of other materials is simple.

Close-up of the PYREX outlet pipe of a storage tank from which foods are pumped to filling stations. The vertical capped-end pipe is a flush-out line. Another important PYREX pipe feature: It's easy to clean in place. Note, too, that the pipe is transparent. You can check cleanliness or pipe contents at any time at any point. ▼



The unique check valve shown below is made of PYREX brand glass pipe reducers.

You can obtain stock fittings and adapters to meet any installation requirement. The entire R. T. French installation was made by factory maintenance men. ▼



How R. T. French achieves pipeline sanitation

Even the slightest amount of pipeline corrosion can seriously impair a food processor's effort to maintain high sanitation standards.

To eliminate corrosion as a sanitation threat and to reduce pipeline maintenance and replacement, the R. T. French Company, well-known Rochester, N. Y., maker of mustards and sauces, installed PYREX brand "Double-Tough" glass pipe.

The company reports that PYREX pipe has ended the threat of pipeline contamination. It is easy to clean in place and does not corrode. Chemically stable, it is unaffected by all acids, except hydrofluoric.

Helps guard flavor

Delicately flavored foods are perfectly safe in easy-to-clean glass. PYREX pipe cannot affect the taste, color or purity of anything it contains.

Savings for you

PYREX pipe can save you money whenever you have a line corrosion or contamination problem. It ends expensive replacement of corroded lines. It is actually the lowest cost non-corrosive pipe you can use. Installation is inexpensive too. And it costs less to clean. It needs practically no maintenance.

How about your plant?

You spend nothing to investigate the uses of PYREX pipe. Your nearest Corning Distributor will gladly discuss your problem and ways PYREX pipe may help. His name is listed below. Write, wire or phone him for prompt attention. Or send the coupon for free detailed literature.

DISTRIBUTOR LIST:

BELMONT, CALIFORNIA
Glass Engineering Laboratories
FRESNO 17, CALIFORNIA
Valley Foundry & Machine Works
NEW HAVEN, CONNECTICUT
Macalaster Bicknell Company
ATLANTA, GEORGIA
Southern Scientific Company
CHICAGO 44, ILLINOIS
Fred S. Hickey, Inc.
NEW ORLEANS, LOUISIANA
W. H. Curtin & Company
CAMBRIDGE 39, MASS.
Macalaster Bicknell Company
ST. LOUIS 4, MISSOURI
Stemmerich Supply Inc.
LODI, NEW JERSEY
Meaney Brothers Corporation
ALBANY 5, NEW YORK
A. J. Eckert Industrial Sales Corp.
BUFFALO 13, NEW YORK
Buffalo Apparatus Co.
ROCHESTER 3, NEW YORK
Will Corporation
HATBORO, PA.
Sentinel Glass Company
PITTSBURGH 19, PA.
Fisher Scientific Company
HOUSTON 7, TEXAS
W. H. Curtin & Company
SEATTLE 4, WASHINGTON
Scientific Supplies
MONTREAL 3, QUEBEC, CAN.
Fisher Scientific Company, Ltd.
TORONTO, ONTARIO, CAN.
Fisher Scientific Company, Ltd.
VANCOUVER, B. C., CAN. Scientific Supplies

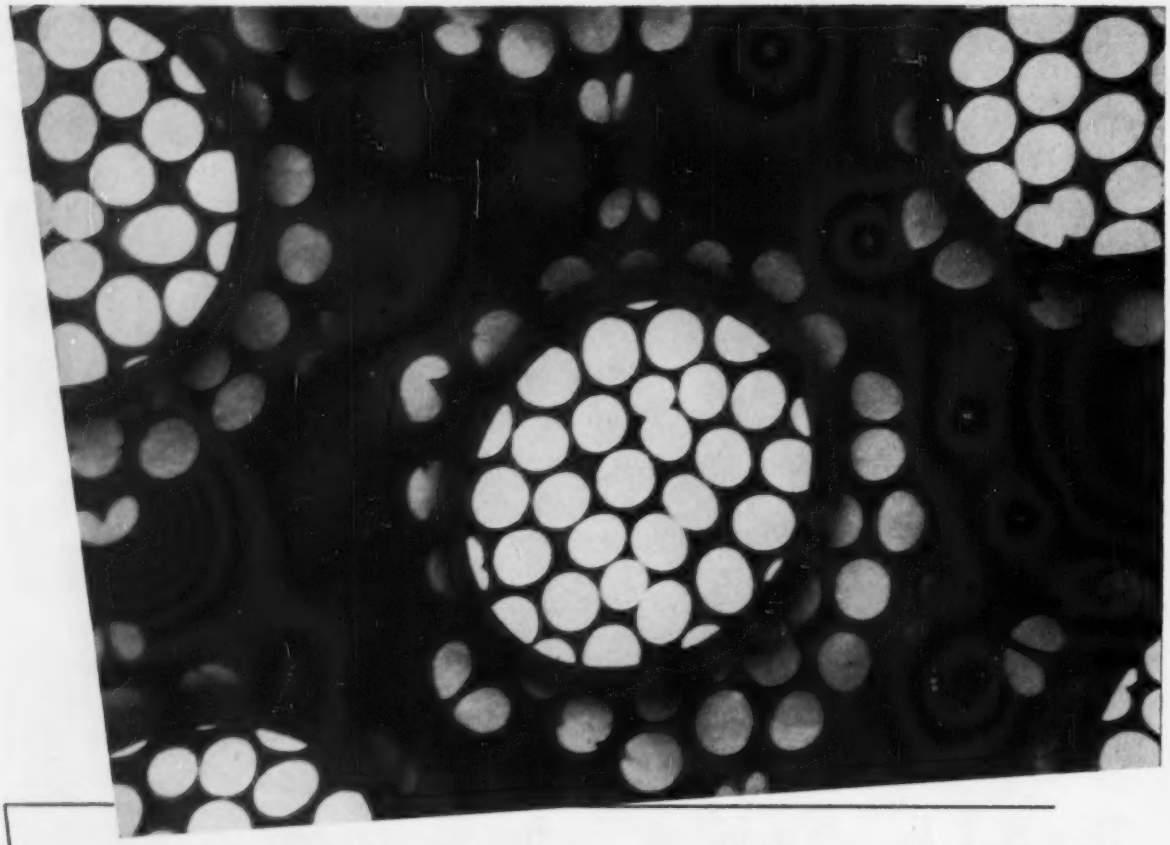
Corning means research in Glass

CORNING GLASS WORKS
52 CRYSTAL ST., CORNING, N. Y.

Please send me the material checked below:
- ☐ "PYREX brand 'Double-Tough' Glass Pipe and Fittings Catalog" (EA-3)
- ☐ "PYREX brand Glass Pipe in the Process Industries" (EA-1)
- ☐ Please have a PYREX pipe representative call

Name ..... Title .....
Company .....
Address .....
City ..... Zone ..... State .....

For more information, use coupon on last page.



22,000 times as big as life

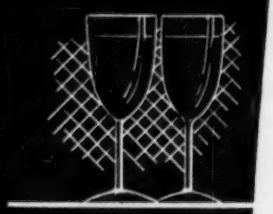
to show one why of Dicalite's "sharp" filtration

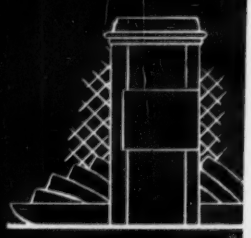
This electron micrograph of one of the more than 10,000 kinds of diatoms shows clearly the delicate, yet rigid, "skeleton" whose lace-like grid helps make diatomite such a superior filteraid. Imagine, for a moment, millions of these diatom frustules—needle-, disc- or boat-shaped—piling up strawpile fashion in the filter pre-coat or filtercake . . . then visualize bacteria or other sub-micron sized solids (enlarged to the same scale) coming against this barrier. Now, in your mind's eye, you can see clearly how the diatomite "grillwork" catches and holds all solids, while the fluid being filtered flows rapidly on through the billions of tiny channels which make up 90% of the filtercake's bulk.

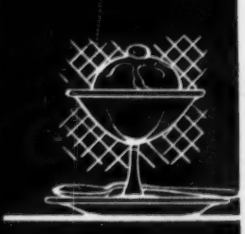
This explains why Dicalite filteraids have proven so successful in the processing of many food products. In hydrogenated oils, for example, Dicalite removes every trace of such unwanted colloidal solids as activated carbon and de-colorizing clays. Every trace of the nickel catalyst is trapped in the Dicalite filtercake, and is easily reclaimed for further use. Dicalite is sterile, insoluble and chemically-inert, and causes *no* color-reversion with the grades of Dicalite usually employed in food processing. If you have a filtration problem, either as respects clarity or throughput, a Dicalite engineer will be glad to advise with you, with no obligation whatever . . . just write us.

Dependable GLC GREAT LAKES **Dicalite**® DIATOMACEOUS MATERIALS

DICALITE DIVISION GREAT LAKES CARBON CORPORATION • 612 S. FLOWER ST., LOS ANGELES 17, CALIFORNIA







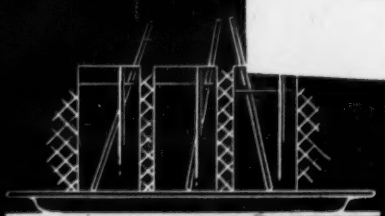
THEY'RE ONLY AS GOOD AS THEIR FLAVOR!

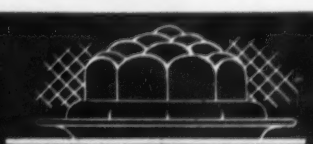
Isn't it true that a food or beverage product
is judged chiefly by its flavor?
Isn't good taste the one consideration
that most influences consumer repeat sales?
Why, then, jeopardize your product's chances
by employing any but the very finest flavors?
We believe our years of specialization
catering to top-flight flavor buyers and technologists
may enable us to render you a quality of service
superior to any you have yet known.
For that reason, we'd like to suggest this:
If you do want extra flavor advantage
on the selling side of your product, come to FRITZSCHE . . .
A FIRST NAME IN FLAVORS SINCE 1871.

FRITZSCHE *Established* 1871
Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* °STOCKS: *Atlanta, Georgia, Boston, Massachusetts, °Chicago, Illinois, Cincinnati, Ohio, Cleveland, Ohio, °Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, St. Louis, Missouri, °Toronto, Canada and °Mexico, D. F.* FACTORY: *Clifton, N. J.*

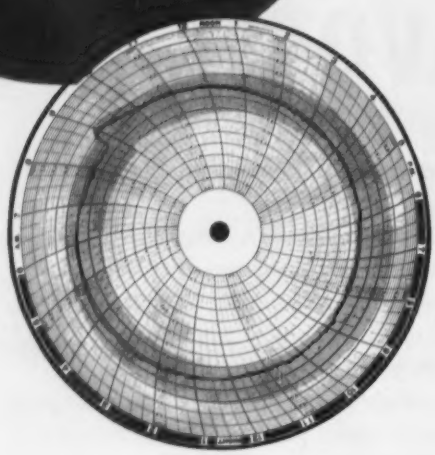




investigate the many advantages and savings possible with

BECKMAN pH

exact control



IMPROVED QUALITY AND UNIFORMITY Continuous pH control eliminates grab-sampling uncertainties. Its unwearying alertness provides unvarying aqueous fluid processing.

PROCESS MATERIAL SAVINGS Beckman automatic pH control supplies *exactly* the right amount of reagent or process material for optimum results. Resulting savings in chemical costs quickly pay for the installation.

MAN-HOUR SAVINGS Skilled technologists can devote their time to more exacting tasks with Beckman pH control on the job.

and now-packaged pH control. An entire system custom built at the Beckman factory...wired, piped and assembled ready for simple plug-in installation. Designed for use in any pH process application, these dependable systems combine in a single package all the components needed for single- or multiple-channel pH process monitoring, recording and controlling. On-the-spot analysis of your requirements as well as installation supervision and personnel training.

For complete information write for Data File 54-18

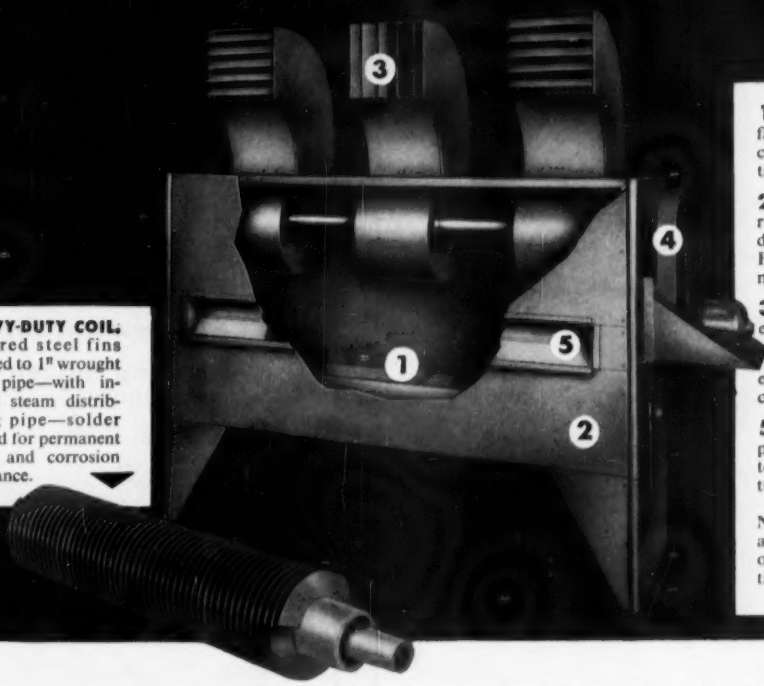
Beckman *division*

BECKMAN INSTRUMENTS, INC.
FULLERTON 1, CALIFORNIA

For more information, use coupon on last page.

Fact:

Rugged Westinghouse Industrial Heaters
available in 24 Sizes . . . 8 Coil Selections . . . 150 Ratings
from 100,000 to 2,500,000 BTU/hr . . . 2,000 to 25,000 CFM each



HEAVY-DUTY COIL. Tapered steel fins bonded to 1" wrought iron pipe—with internal steam distributing pipe—solder dipped for permanent bond and corrosion resistance.

1. Proven, Westinghouse-manufactured, extended surface heating coils good for continuous operation up to 200 psig.

2. Die-formed casings with rounded corners eliminate accidents and dirt catching pockets. Front and back panels easily removable.

3. Multiple louvered outlets for efficient distribution of heated air.

4. Self-aligning, grease-lubricated ball bearings mounted outside casing, readily serviceable.

5. Face and by-pass dampers permit continuous air circulation to maintain uniform temperatures.

NOTE: Louver type mixing box accessory permits introduction of fresh air for make-up and ventilation, with or without filters.

Solve your space heating problems with Westinghouse-Sturtevant Industrial Heaters. Eliminate cold, drafty conditions caused by excessive cold infiltration through leakage or exhaust.

Two Types With Wide Applications:

GENERAL PURPOSE HEATER . . . For manufacturing areas, warehouses, garages, commercial buildings—with standard non-ferrous heating coils.

HEAVY-DUTY HEATER . . . For continuous-duty high-pressure systems, or industrial process work—with wrought iron heating coils.

The compact packaged engineering of every Westinghouse-Sturtevant Industrial Heater provides units for mounting on floor, walls, or suspended from ceilings. In short, they can be placed where they will do the most good, and can be relocated to meet any change in plant layout.

Every unit is backed with a Westinghouse exclusive—*one warranty*. Only Westinghouse makes all principal components—Fans, Heating Coils, and Motors. You can get unit engineering and single equipment responsibility.

MORE FACTS? To find out how to solve your particular heating problem, call your Westinghouse-Sturtevant Sales Engineer . . . he is the "Man With The Facts" on heating, air handling, and electronic air cleaning . . . or fill in coupon below.

WESTINGHOUSE AIR HANDLING

YOU CAN BE SURE...IF IT'S

Westinghouse

J-60427

Westinghouse Electric Corp.
Sturtevant Division, Dept. 17A
Hyde Park, Boston 36, Mass.

Please send more information on your Industrial Heaters.

NAME AND TITLE .....

COMPANY .....

CITY ..... STATE .....

For more information, use coupon on last page.

On January 24, 1935...

this container opened

How a new container opened up a whole new market for the brewing industry...

doors for everyone!

On January 24, 1935, beer and ale *first* began to go to market in a revolutionary new container developed by the American Can Company—the can trademarked "*Keglined.*" This container was the *original* can for beer and ale.

Its introduction twenty years ago started a new trend in packaging of beer and ale for use in the home.

It allowed the brewer to package beer conveniently and economically in a really practical container for the first time.

It gave the distributor an easier and lighter package to handle, and one which took less space.

For the retailer, it solved at one swoop the problems of shelf space, breakage, storage room and deposits.

The consumer found the can trademarked "*Keglined*" was lighter to carry, needed less refrigerator space, eliminated deposits and returns.

This is just another example of Canco pioneering in the development of new containers designed to bring *your* products more efficiently, more economically to more people.

Go first to the people who are first!

American Can Company

CANCO

New York, Chicago, San Francisco; Hamilton, Canada

YEAR AFTER YEAR

IT'S Alvamaple

For real "True-To-The-Tree" Goodness!

In many food plants ALVA imitation maple has been the standard for over thirty years as flavoring for candies, syrups, baked goods, extracts, ice cream, etc.

Wherever the best real North Woods flavor is wanted, try ALVA imitation maple. We think it will be your standard too, year after year.

Samples and recommendations for your particular product at your request.

van Ameringen-Haebler, Inc.
521 West 57th St., New York 19, N. Y.

Alva FLAVORS

HOT ISSUES of '55—guaranteed annual wages, increased benefits, seniority, and considerations of the individual vs. the mass—were pinpointed by General Foods' Samuel Burk.

Exploring growing complexities of "Human Relations In a Changing World," industry experts meeting in Silver Bay Conference give you practical—

Tips on '55 Labor Problems

★ Guaranteed Annual Wages ★ Fringes ★ Seniority ★ Numerous Other Aspects and Factors

FE STAFF

In discussing "What's Ahead for Management and Labor" at the recent Silver Bay Conference, Lake George, N. Y., Samuel L. H. Burk, director of personnel administration, General Foods Co., White Plains, N. Y., emphasized these four specific "hot issues"—

1. **Guaranteed annual wages.** These schemes have many names, but the end-product for any of them would be the same. They are "foot-in-the-door" plans, and once one is inserted in an agreement, it will be difficult to remove or to keep from expanding.

Plans now afoot call for a full year guaranteed wage at a rate which will maintain the standard of living reached while employed.

This is a risk economy. One segment cannot be made secure by unreasonably increasing the risk of another segment. And one segment should not ignore responsibility for limiting the risk of all investors. Employees are investors.

2. **Increased benefits at lower cost to workers.** There will be an intensive drive to increase benefits for employees while decreasing the cost to them. And there will be more insistence on coverage for dependence.

▶What is management's responsibility for helping the worker provide against the risk associated with unemployment or risks affecting his earning power?

Management can facilitate provisions of protections, but whether the owner and/or consumer should bear the cost is a problem that management has not settled. If society in general is responsible for bearing the expense of such protection (as against the individual), then we must recognize that such protection must be made available to all, not only to those in favorable bargaining situations.

3. **Seniority.** This is a perennial "hot" question. It is of increasing concern among unions on local levels and also of local managements because of the loss of efficiency often involved through the operation of strict seniority principles.

Present insistence on seniority is due primarily to failure of management in the past to make fair and equitable decisions, or to convince workers of fairness and equity, or to gain acceptance of other measures of merit.

There is danger in the acceptance of strict seniority agreements. It may lead to a worship of the mediocre performance. Where merit and performance are relatively equal, or where performance is not important, then seniority may govern. But in most cases management is duty bound to recognize the effective worker over the poor or mediocre worker.

4. **The individual vs. the mass.** There is salient importance in the man as an individual as well as the man acting in a mass or group.

Sen. Wallace F. Bennett of Utah, speaking at the AMA Personnel Conference in Feb. 1954, pointed out that it is impossible to eliminate conflict by molding man into "faceless patterns and robot units of a greater organism called The State."

LIVELY "batting about" of ideas and experiences marked the special table sessions at the conference. Here, a number of management "reps" are down to shirt-sleeves as they compare cogent concepts for improving personnel relations in their companies.

He pointed out that in America in recent years a similar method has been widely accepted—that of transferring every man's problem to an impersonal level by considering him a part of a mass.

This idea is still being perpetuated because we have been deceived by the false assumption of the mass idea—mass psychology, mass planning, mass program, mass media.

The Senator suggested that a partial solution might lie in what he termed "the phantom factory," a place where men would go to make not only a living but also a life. Such a factory, he said, would help to satisfy five basic human needs. With these, personnel administrators must be concerned:

1. *A man's need to be himself, to be respected as an individual.* 2. *His need to grow and to develop his own unique abilities.* 3. *His need to have his achievements recognized.* 4. *His need to belong to a group or a cause.* And 5. *His need for a chance to contribute something above and beyond the mere call of duty.*

Our real hope for industrial peace goes back to the individual employee. However, since we have built a pattern of mass action, we must continue to operate under it.

Next pointed out was the A-B-C that should be of primary concern to those responsible for people in industry:

A. **New examination of personnel administration in each company in the coming year.** We need to line up the objectives of our personnel administration, determine our controlling personnel policies, figure out the line-versus-staff authority and responsibility in this area, secure cogent top management support for our personnel policies.

B. **Primary concern for conservation of human as against material resources.** This goal can be achieved through optimum utilization of the individual. Maintenance of desirable working relationships among members of the productive team, the maximum development of all individuals.

C. **Recognition of the main activities of the personnel administrator.**

In the latter, three responsibilities are salient. First, this administrator is to obtain capable people for the job, know what the elements of the job are, understand what human skills and qualifications are necessary for the task, find qualified people who are willing to accept the work and the terms of employment.

Next, he is to put people to work efficiently, without damage or waste, by showing them individually what is expected of them, the policies governing their jobs, and the standards of their tasks. Also, they are to be supplied with the necessary tools and skills. Further, their success is to be appraised periodically, and they are to be told the results of the appraisal and are to be rewarded for their success appropriately.

Finally, the administrator is to maintain willingness on the part of the individual to work as a member of the productive team. He is to show each individual how to satisfy his basic needs to do his work as a member of a group.

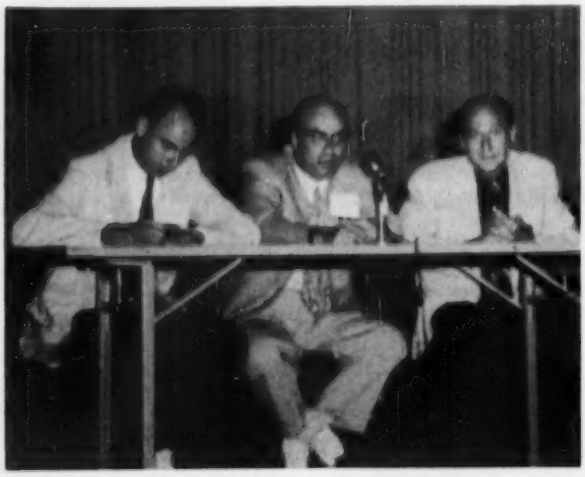
To this end, the personnel administrator must see that the individual is adequately and equitably compensated for his efforts . . . that he has reasonable protection against economic insecurity and is free from social insecurity that might arise from actions of those above him . . . that he has social satisfaction and recognition, a chance for greater utilization of his capacities, and some participation in the planning that affects his welfare.

Liability of top management is a major factor, with principal responsibility lying with the chief executive, who must establish the personnel administration policy for the organization as a whole, maintain harmonious relationships among his immediate subordinates, and see that his subordinates follow the instructions along with their subordinates

Changing Labor Scene

During this Silver Bay meeting, labor writers were questioned by industrial relations men—James M. Black, personnel division manager, American Management Assn., New York City; Willard V. Merrihue, manager, employee relations, General Electric Co., New York City; and Wilbur McFeely, vice-president and director of industrial relations, Riegel Paper Corp., New York City.

Labor writers were Stanley H. Brams, publisher, *Detroit Labor Trends;* Stephan K. Galpin, *Wall Street Journal,* Washington, D. C.; and A. H. Raskin, *New York Times.*



POINTED QUESTIONING of three labor writers (left) by three industrial relations men (right) was a revealing feature. Unions outsmart management in relations with the press, said writers—particularly since management tends to withhold comments, whereas unions are anxious to have labor's story in print. Result: Labor's publicity influence on public is greater. Left to right: Raskin, "N. Y. Times"; Brams, "Detroit Labor Trends"; Galpin, "Wall Street Journal"; Moderator Driver, Atlantic Refining Co.; McFeeley, Riegel Paper Co.; Merrihue, General Electric Co.; and Black, American Management Assn.

Panel moderator was Randolph S. Driver, manager, personnel administration, Atlantic Refining Co., Philadelphia. And now to the highlights of the session:

Question: Do you think U. S. industry is sufficiently aware of the importance of keeping the press and public adequately informed of critical labor-management situations?

Mr. Galpin: "Industry is not aware of the importance of keeping the public informed. And in my opinion managements are wrong in thinking the public should be informed only in critical situations. As a labor reporter I get much more consideration throughout the year, and particularly during critical situations, from union people than from management people.

"Union people are political people. They know they must sell their ideas. Employers have a point of view to sell, too. And they should sell their ideas the year around, not just in critical situations."

Mr. Raskin: "I think there is a grave hesitation, on the part of management, when things are tough (and even when things are not so tough) to talk about what is happening in labor negotiations. This is based on the understandable feeling that if the union knows exactly what is on your mind, or if you tell the public too much, you may jeopardize the negotiations.

"I have found this fear does not have much justification. The more everyone knows about the negotiations, the more smoothly they seem to go. Very rare is the situation in which it is wise to withhold information."

Question: Do you think that labor-management relations are improving or deteriorating under the National Labor Relations Law—the Taft-Hartley Law?

Mr. Raskin: "I think labor relations in this country are improving. This happens to coincide with existence of the Taft-Hartley Law, but it may not necessarily follow.

"I don't feel that Taft-Hartley has meant too much in the srongly unionized industries, such as steel or oil. In the textile industry, which has been half-organized, Taft-Hartley has certainly made it difficult to organize the ununionized section. The law has been a significant factor in blocking new organization."

Mr. Brams: "I endorse that. Statistics show that over the past three or four years (Taft-Hartley came in '47), there has been a reduction in number of man-days lost by strikes, relative to number of man-days worked.

"The unions are growing up. And as they mature, they become more conservative. It may or may not be a coincidence that labor management relations have improved during this Taft-Hartley era."

Question: If Taft-Hartley has had so little effect on improvement of labor-management relations, why are union leaders so violently against it?

Mr. Galpin: "There are many reasons, depending on the particular union and how it is affected. Principal reason, affecting all union people, is that Congress, for the first time since passage of the Wagner Act, has said that unions have gone too far and that some balance must be restored. The Wagner Act put much restraint on management and little on unions."

Question: According to terms of the steel settlement, the guaranteed annual wage is something for consideration perhaps in 1956. But it is thought that Mr. Reuther will press hard for it in 1955. In view of the rivalry between Mr. Reuther and Mr. McDonald, do you think Mr. Reuther considers a strike for the guaranteed annual wage in 1955?

Mr. Brams: "From the way he talks now, there is a possibility he will. Reuther and his people have started putting out literature describing their plan, skirting the details, but outlining the broad program.

"Further, they are sending representatives into the locals to publicize and explain guaranteed annual wages as the union interprets them. They are attempting to create a support for the idea at the local levels. However, they are not talking yet in terms of actual wages.

"The careful observer will see that there are large problems involved in this wage idea. Basic is this fact: The way the labor laws are written today, there is no means of integrating private benefits (private guarantees) with the state unemployment compensation benefits. Such integration is important."

Question: Do you think there will be a drive in the next two or three years for a shorter work week?

Mr. Brams: "Such a drive already has begun—in the steel industry and the auto industry. It has been the subject of discussion at CIO meetings, though it hasn't gone beyond this stage.

"In the Mine, Mill & Smelter-Workers Union it has been hailed as an objective. And the 35-hr. week has been installed in a number of southern textile mills. The shorter work week is perhaps inevitable."

Mr. Raskin: "I do not know how rapidly shortening of the work week will be achieved. But it is spreading in some industries. The International Ladies' Garment Worker Union has now decreed that none of its unions can sign a contract that does not provide for a 35-hr. week.

"There is, however, a recognition on the part of labor leaders that the whole annual improvement theory, and

the whole idea that a higher standard of living is geared to an increased total national production, would be jeopardized by the universal adoption of a 35-hr. week or anything shorter than the existing work schedule.

Question: Various European observers believe that a labor party in this country is inevitable. What evidence do you see for or against such a movement?

Mr. Raskin: "I think it extremely unlikely we will have a Labor Party—at any rate, in the near future—unless there is some realignment of forces, or unless the economy of the country makes it possible.

"People who started out as socialists in the labor movement are shifting further and further away from that philosophy, partly because they like the capitalistic system as it works here (despite their complaints as to how it operates), and partly because of the way socialism has worked abroad.

"There may be a regrouping within the Democratic and Republican Parties, with the effect of creating a quasi-Labor Party. But it will not be a real Labor Party. And labor will do all it can to keep it from being identified as a Labor Party.

Question: Certain labor leaders have argued for area labor-management councils to decide who can expand and in what direction. In view of this and similar trends, what is the future of these area labor-management councils that would plan productivity and therefore might, in the eyes of the union, assure easier administration of a guaranteed annual wage?

Mr. Galpin: "It seems to me that support for such a council would be local. As the standard of living of the nation's hourly workers continues to rise they are going to get less and less radical—if we can call the idea of these councils radical."

Mr. Raskin: "I think such councils might come about to a considerable degree. I think there will be increasing pressure for labor to have a larger voice in problems of distribution, on the ground that these problems are related to job security and that one of the tasks of the union is to protect the jobs of its members.

"The unions feel, too, that they have contributions to make to efficient management and that there ought to be regular machinery through which to make such contributions.

Mr. Brams: "For some time to come management generally will draw a firm line against sitting down with unions and formally entering into co-determination, or mutual planning, or anything similar.

"At the same time, we are already seeing that managements today generally call in their union for discussion when they plan to relocate a plant, or build a new plant, or when they have a large layoff coming, or a large hiring in prospect. These things can lead to the possibility that sometime there will be a more formalized relationship between unions and management."

Question: Can you foresee any particular union demand in the next 12 months that will be a "hot" issue?

Mr. Brams: The companies that are not up to what might be called "par" on pensions will probably feel some pressure in that area. Until recently, the par was $137.50. This was in the auto industry and was the amount that a 65-year-old worker with 25 or 30 years of seniority could be expected to get with his social security included.

"Steel raised that to $140.00. There are many companies still well under that level, so there will be pressure there.

"Also, there will be the pressure for the 5c. wage increase. This came about in the auto industry under the annual improvement factor and was echoed in steel. Moreover, there is a continuing pressure for more paid holidays. All of these fringes are being pushed, and I do not think it is fair to say that any one of them is going to be emphasized to the exclusion of any other."

Question: There are several investigations of union welfare funds starting now. What might come of such investigations? Will there be any legislation or any greater employer interest?

Mr. Galpin: "Two big investigations will be conducted by the house and senate committees, and one by another house committee. Some sort of legislation ought to come out of these investigations.

"Whether congress will establish standards for administration of union welfare funds or just create a strong incentive for the states to have the state insurance commissioners regulating these funds, I don't know.

Action Aspects

Round-up of the collective bargaining issues for 1954 and 1955 was presented by Richard P. Daugherty, president, Television-Radio Management Corp., Washington.

He pointed out that a study of the health, welfare, and fringe regulations of the old Wage Stabilization Board will give a picture, and thus a forecast, of the collective bargaining blueprint for 1954-1955.

Older established fringe benefits are being improved. There is steady pressure for seven paid holidays, high-shift differentials, a third week of vacation for those with from 10 to 15 years of employment service, broader health and welfare plans, more coverage for dependents of workers, and also for dependents of retired employees, and increased pension allowances.

Among new fringe benefits being demanded, and secured to a certain degree, are severance pay and funeral pay (death benefits for members of families) or time off.

Negotiated results in the wage picture have been and will continue to be mixed. In general, settlements to date have been the lowest in four years. For months, the labor front has been quiet, but a slight increase in industrial strife will probably come before the spring of 1955.

There are two main issues to watch in the collective bargaining ahead: Guaranteed annual wage and fringe benefits.

The most dramatic and fundamental collective bargaining issue of 1954 is the guaranteed annual wage (GAW). Even though the union may not achieve it in any important 1954 contract, the issue is dominant and it will find a place on future bargaining tables.

The problem is so fundamental to our economy that management cannot meet it with emotional objections or with public relations cliches. Management must become thoroughly acquainted with all its factors. Primary tools for the defeat of this issue are *basic economic reasoning* and *objective employee education*.

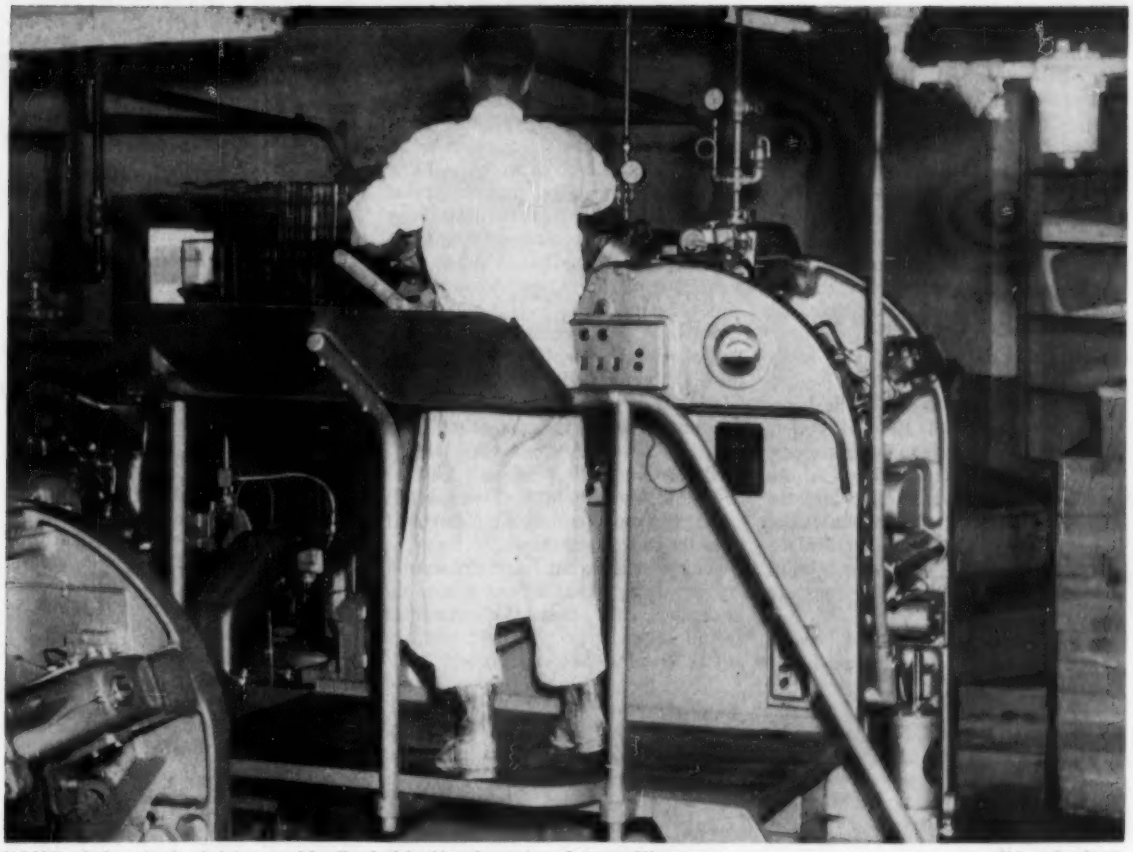
There are three main spheres in which the success of guaranteed annual wage negotiations would adversely effect industry:

1. Demands for guaranteed wages are inherently related to socio-political unionism, which espouses a planned economic society.

Many realistic union leaders see (with apprehension) guaranteed annual wages as the cornerstone of a state-planned society that undermines dynamic collective bargaining. Seen here is a base for gradual submergence of economic unionism in favor of political unionism.

Only a segment of the total union movement is actually beating the drums for GAW. This segment is composed of those unions favoring the planned economy way of life and clamoring for equal union authority in the control of

(*Turn to page 159*)



NONE of the single dairies could afford this ½-gal. carton former-filler now in action at the new consolidated plant. Running 6-hr. daily, it supplies needs of all four member companies.

★ A losing battle was being waged in Columbus by Pailet, Keller, Distelhorst, and Model. Competition from the "nationals" had grown unbearably tough for these small dairies. No "local" had the wherewithal to fight it singly . . . **But then that word "singly" gave Edward Pailet his winning idea of having—**

Four Small Plants Become *One*

To Challenge the Top Operators

BILL TROY
McGraw-Hill News Bureau, Cleveland

Back in June 1953, four independent dairies in Columbus, Ohio, merged—*with the object of meeting competition from two national concerns operating in the area.*

And now, with slightly more than 1½ yr. of operation under its belt (eleven months in its own building), the consolidated company, Harmony Farms Dairies, Inc., has climbed to the No. 2 spot in the city.

It has boosted gross sales 5%. And it can point to the following significant cost savings in the various phases of its operations:

▶ **Processing:** Reduction in number of units—in a ratio of 2 to 1 and sometimes 3 to 1—with an estimated overall increase in efficiency of 10-15%.

▶ **Distribution:** Retail delivery truck miles have been cut 15-20%, with an accompanying 5% increase in business.

▶ **Labor:** There is maintenance of status quo, so far as total labor force is concerned, but with much greater productivity and better quality con-

trol through the specialization that greater volume allows.

▶ **Utilities:** Approximate 30% savings on both fuel and electricity.

▶ **Other benefits include:** A sharp reduction in cost of gasoline for trucks—down to 6¢ below list; purchase of liquid wax in large quantities, with consequent savings; elimination of a multiplicity of set-up charges on printing milk cartons; and a full-fledged advertising program via TV, radio, newspaper, and point of sale ads on a $24,000 annual budget.

One Dairyman's Dream

Harmony Farms is really the long-time brain child of Edward Pailet, president of both the new Harmony organization and Pailet Milk Co. As head of the latter, a firm he built to the No. 4 spot in the area, Mr. Pailet felt that the independents well might merge into a group that would be in a much better condition to compete with the "nationals."

At the same time it would be able to keep step with technological and marketing advances in the dairy field.

Specifically, he lamented the fact that his concern and the other independents just couldn't afford to push a city-wide advertising program. But he argued that together, under one name, they certainly could get results.

Support for his plan was slow in coming, however—until Jan. 1953, when Borden introduced ½-gal. milk cartons. The other major companies quickly followed. And within a few months practically 30% of all the milk sales in Columbus were in ½-gal. paper containers.

Badly hurt, the independents—about 10 of them—quickly realized that the investment needed to compete would be nearly impossible if tackled company by company. A ½-gal. Pure-Pak machine costs $10,000 a year to rent, and the purchase price is around $150,000. With this problem in mind, the desire for merger became more popular. Upshot was a meeting of the independents to discuss the project.

In June 1953, four of the companies—Pailet Milk Co., A. Keller & Son, Distelhorst Dairy Products, and Model Dairy—incorporated under the Harmony name. Officers other than Mr. Pailet were Anton Keller III (A. Keller & Son), vice-president; Elwood Distelhorst (Distelhorst Dairy Products), treasurer; and Robert Baynton (Model Dairy), secretary.

They decided that Harmony should operate as a purchasing and processing company, and that the members would retain their corporate identity so far as sales were concerned.

This meant that the company would buy raw milk from the producers, process it, and sell it to member dairies (as close to cost as possible—the cost including all overhead such as processing, labor, gasoline, truck maintenance, etc.).

Organization Details

As soon as feasible, it is the aim of the officers to make Harmony an entirely non-profit organization, with all the returns accruing to the separate milk companies on the basis of annual volume and percentage of their original investment in the combine.

To implement this arrangement, Harmony voted its members two types of stock. Class A affords the sole voting rights on matters of overall business policy. This is split on a straight 25% basis. Class B stock represents the percentage of investment made by each company. It is the measure on which profits are paid.

Original investment amounted to slightly over $500,000, with Pailet Milk Co. putting up ½ and the other three companies splitting the remainder pretty close to equal portions. The officers realized, however, that to maintain their separate corporate identities they would have to maintain their competitive position.

So a strict accounting is kept by each company of its volume, and then at the end of each year this is compared with the total volume. The company that builds its volume in that year, while the others are standing still, is entitled to a proportionately larger share of the profits.

Those companies having reduced volume are allowed to remove from the original funding "kitty" an amount equal to their percentage loss, which of course cuts their percentage holdings of Class B stock. This arrangement leaves each company in complete command of its own sales, and it gives the individual owners the option of selling out to anyone at any time.

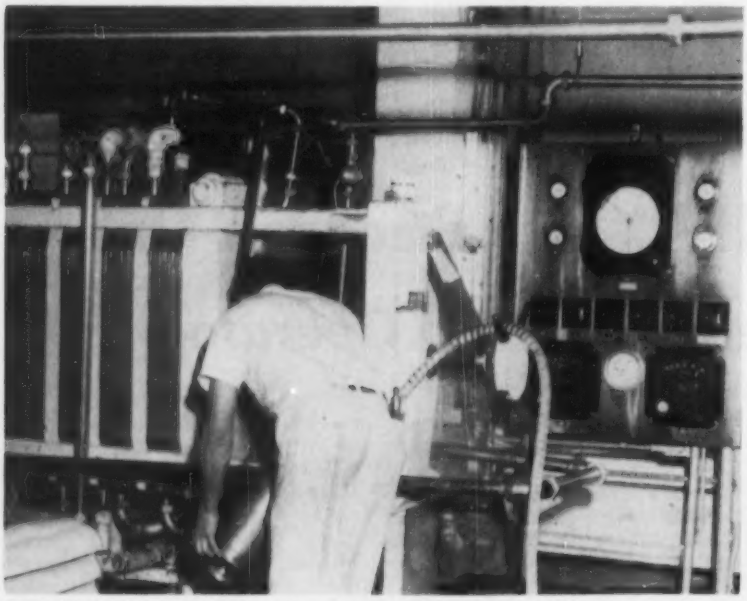
Central Processing Plant

At first, the members continued to work from their own plants. But they knew that no real economies could be effected until they converted four separate processing lines into one. So they decided to buy a plant, and settled on a vacated piano factory (in eastern Columbus) with approximately 40,000 sq. ft. of space.

Banks and several insurance companies rejected their bids for a loan. But Farm Bureau Insurance agreed to finance the building.

Actual move into the new quarters came last Mar. 15, nine months after formation of the company. Prior to the shift, a careful appraisal was made of all equipment in the four plants to decide which units should be kept, which ones should be sold. Equipment contributions were measured in dollars and cents as part of each company's original investment.

Three of the dairies had been using coal boilers and one (Pailet) gas. Into the new plant went Pailet's gas boiler and a newly purchased one. Net result is that the fuel bill, which had



TWO high-temperature, short-time pasteurizers (one shown) supply milk continuously to fillers. Previously, three of plants had batch units.

been running around $1,000 per month, is now down to about $700. Electricity to run the four plants cost approximately $1,700 per month. That bill has now been cut to about $1,200.

Economies in Equipment

Overall the efficiency of process units has been increased by 10-15%. Specifically, here are the highlights:

1. The four dairies had needed four can washers—each running an average of 2 hr. per day. Now, only one is needed. But it works a full shift.

2. Three of the four dairies were using batch pasteurizers. Only Pailet employed a short-time unit. In the new set-up, the Pailet pasteurizer and a new short-time unit are working full time—one on 3.5% butterfat milk (for ½-gal. cartons) and the other on a 3.8% product.

The volume production of 3.5% butterfat milk allows Harmony a 3¢ retail differential between two 1-qt. cartons and one ½-gal. container. This is an integral part of the new operation, since 90% of its production is milk and milk products.

3. One bottle washer has replaced four. The percentage of paper sales in the area is now better than 50% overall—much higher than that in retail stores. But each of the companies was compelled to have a $5,000 washer, each used only about 2 hr. a day. One machine now handles the entire job easily.

4. As for carton making and filling machines, three of the four dairies rented "midget-sized" 1-qt. paper units at a cumulative cost of around $12,000 per year. One dairy had no machine at all, and was forced to buy all its carton milk at wholesale. None of the companies owned or rented a ½-gal. unit. Capacity of the three 1-qt. fillers was 60 qt. per min.

However, the new company rented two "junior-size" 1-qt. units (Pure-Pak) having a combined capacity of 70 cartons per min., and one ½ gal. machine with a capacity of 25 per min. The quart machines each rent for $5,000 per year, and the ½ gal. one for $10,000.

Harmony doesn't plan to buy any of the machines outright. First, because the initial cost is prohibitive. Secondly, if there is a radical change in carton styles in the next few years, they won't be stuck with a large unrecoverable investment. The ½-gal. unit Mr. Pailet estimates, would have been used only about 2 hr. per day in his own plant. Now it runs at least 6-hr.

Money is also being saved (the company in this instance doesn't know exactly how much) on purchase of cartons. This results from the larger volume bought under one name, and by elimination of four different titles, which reduces the number of "set-up" charges—averaging $50–$100 per type of carton. Also, liquid wax is now used, effecting an average saving of $5,000 yearly.

The merger has also helped broaden the range and productivity of the ice cream business, which makes up about 10% of Harmony's total volume. Originally, Pailet Milk Co. was the only one with a condensing pan. This $10,000 piece of equipment lay idle a good deal of the time, while the other companies sold their surplus milk to dairies with proper facilities to handle it. Now the pan handles the requirements of all the companies.

Also, the dairies were using batch ice cream freezers. Now, with a continuous freezer (Vogt), the company has broadened its ice cream line.

None of the four dairies had ever been in the business of making butter or yogurt, and Harmony doesn't intend to process these. They are purchased from others and re-sold at 2¢ above cost to the member companies "to allow for shrinkage."

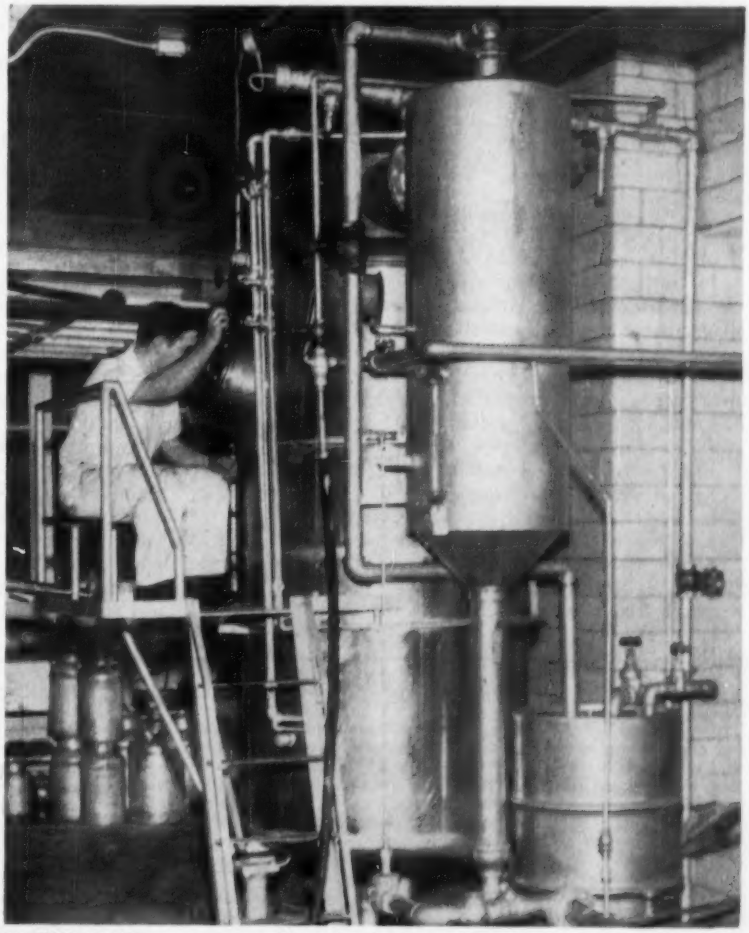
Distribution Re-Shuffled

Setting up the combine posed some serious distribution problems. The combined fleets number 35 trucks, 18 wholesale and 17 retail. Each, of course, carried its own company name. So the trucks were gradually repainted with the title "Harmony Farms Dairies." Two of the companies felt that disposing of their name altogether would incur customer resistance to the change. So, in smaller letters, they continue to carry the name of their own company.

But the biggest problem was in geographical placement of the new plant. Most of Pailet's retail customers were in northern Columbus. Keller's were in the east and south, Distelhorst's in the west, and Model Dairy's in the north.

While there were definite areas of

(Turn to page 184)



VACUUM PAN converts surplus milk to concentrate, cuts company's outside purchase of dairy products for ice cream manufacture.

Hood's Junior Board. *It Is Constantly Shaping–*

Top Executives for Tomorrow

Years ahead of the need, management timber is selected and seasoned. Thus there is always talent to fill any breach. And this grappling with responsibilities grooms "right men" to succeed to senior posts

IVAN C. MILLER
Associate Editor, "Food Engineering"

Progress and growth won by H. P. Hood & Sons, Inc., of Boston, in the highly competitive dairy field, has certainly not been the result of accident.

In truth, its consistent expansion and advancement is the handiwork of the company's management. And this management is specially notable in that it is already anticipating its executive requirements as far ahead as 1975.

In short, it is making provisions *today* for the management needs of *tomorrow*. Particularly, this includes filling the need for trained junior executives to assume the responsibilities of senior executives in the future years.

Importance of the function of the company's Senior Board of Executives is best realized when a person is familiar with the form of the management.

This top board "bosses" all operations. Every step in the business is assigned as the responsibility of one of the board members, and one only.

Briefly, this board acts as a composite "general manager" of the company. In effect, then, each member is "a fraction of a general manager" in addition to having complete authority for all operations in his own artery.

Launching of the J. B.

Then in 1939, Company President Harvey P. Hood realized the further need for a planned method for preparing the juniors to move up into the posts of artery heads and so become members of the Senior Board. He visualized other needs and advantages also. So, with the approval of the Senior Board, a Junior Board of Executives was authorized.

And proof of the pudding is the fact that all but four of the present Senior Board got their executive training as members of the Junior Board.

Overall responsibility of department administration separates the artery head from the mass of the company's operating details.

Before introduction of the Junior Board, such assistance was generally limited to the knowledge and experience of

Salient Aim: Understanding

Says Hood top management: "We know from experience that real thinking is behind the recommendations developed by our Junior Board of Executives. Each proposal is backed up by a detailed committee study, with supporting conclusions and complete suggestions as to the methods.

"Only after unanimous Junior Board approval is a recommendation referred to the Senior Board, where it must again win a unanimous vote before adoption. Thus, approval of more than 40 men is required.

"Accordingly, when a group of men have a common objective and they supplement that with both understanding of the problem and understanding of each other, it is not difficult to find a proper solution.

"Even greater is the challenge of the future. Industry has made far more progress in technological development —such as in machines and in job methods—than in the field of human relations. The prime questions of understanding, of knowing what makes us do what we do, what the other fellow is thinking, and why he thinks that way, are complex problems of human relations that are still ahead of us.

"The better we understand each other, the more we can accomplish. Through our Senior and Junior Board, we believe that H. P. Hood & Sons has the basis of bringing about this better understanding—with decided benefits to the company and everyone associated with it."

subordinate executives in the artery head's own department, and other Senior Board members. Precluded was much of the detailed knowledge of inter-department coordination necessary for overall company progress.

But today the Junior Board, in addition to initiating new ideas and making suggestions for improvements, may be called upon by the Senior Board as a fact-finding unit within the realm of company operations, or in preparation for changes and additions beyond company activities. It has no authority. Its purpose is to suggest means of improving the company's operations.

What It Is and What It Does

Initially in '39, President Hood appointed 16 junior executives to membership on the Junior Board. Membership was for one year, with four members retiring every quarter, and four new members being elected to succeed them.

Then in 1950 the membership was increased to 20, and the quarterly turnover was increased to 5 members. A retired member cannot be re-elected for at least six months. The board chairman is also elected each quarter.

During the first years, problems considered by the Junior Board originated almost entirely within its membership. Each member was then, and still is, expected to submit at least one worthwhile idea a year for the board's consideration.

When a problem is accepted for study, it is turned over to one of the standing board committees. Later, the committee report is reviewed by the board and either approved unanimously or rejected.

An approved recommendation is sent to the Senior Board for consideration and action. Accompanying each suggestion passed on to the higher group are not only full details aimed at justifying the idea, but also working data for incorporating the idea into company operations.

Most of the ideas thus far considered by the Junior Board have proved highly practical. Of 514 projects studied, 33 concerned the Junior Board itself and required no action by the Senior Board. Of the remaining 481 projects, 463 were submitted to the Senior Board for consideration. *Only 16 have been rejected in whole or in part by the Senior Board.*

Soon after launching of the Junior Board, it became apparent to the Senior Board that the junior's proximity to operating details and the thoroughness with which they studied problems were most valuable assets. As a result, the Senior Board now submits approximately one-third of the projects studied by the Junior Board.

Although the value of the Junior Board was soon established, there was an inherent weakness noted in its structure: Although composed of 20 members, 5 of whom are replaced every three months, and though a retiring member cannot be reappointed or re-elected for a period of six months, board membership has remained limited to less than 25% of the eligible junior executives.

As a remedy and to broaden the sources of information, membership on Junior Board committee was widened to include non-board members. These additional members are drawn from all levels of management. They are appointed to committees only after the individual's immediate superior has been consulted.

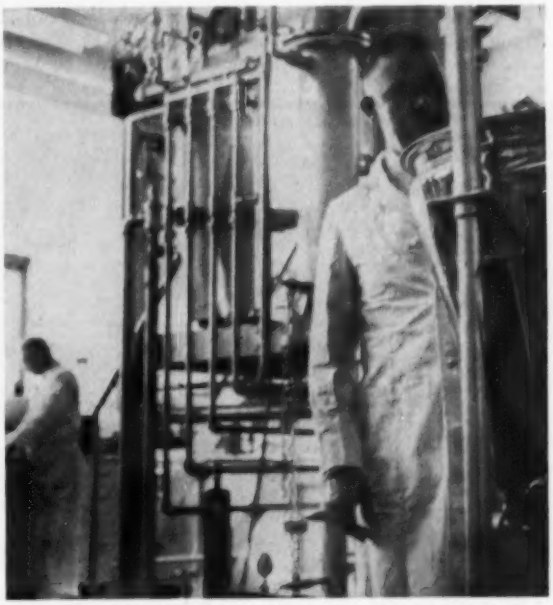
This augmenting of the committees has had several advantages. First-hand experience and knowledge at the operation level is now more accessible. The board's fact-finding facilities thus are enlarged. Also the means has been provided of tapping know-how for better outlining the incorporation of changes in the operations.

Appointment of non-members to board committees—as many as 30 at the present time—has had two other estab-

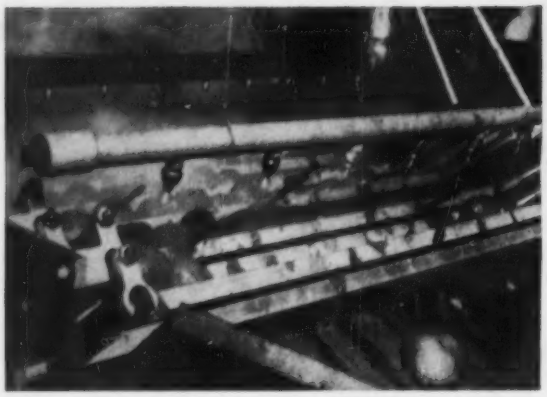
(*Turn to page 184*)

ACTION VIEW of one of four Junior Board standing committees. These teams develop not only working facts but also skilled leaders.

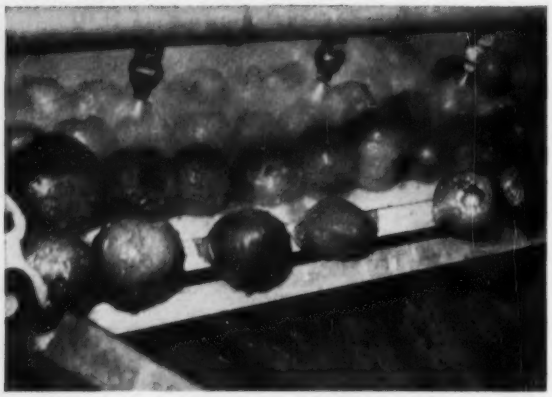
TASTE PANEL that checks consumer preference is just one of many successful endeavors sparked by Hood's enterprising Junior Board.



LABORATORY for technical research is another prime asset of company engineered by active juniors.



JAW, or interstice between Stepeel shelves, is opened by cam action during reciprocal movement.



CLOSED jaws of unit hold loose skins and strip them off as tomatoes fall from one shelf to the next.

Peeling by Hot Air-Blast

By removing only skin, efficient new tomato peeler increases yield and retains vitamin C

BRUNO PILORZ,
Food Process Consultant, Piedmont, Calif.

Under protective wraps for three years, a revolutionary new tomato peeler was introduced this past season. It incorporates a new peeling concept—the use of a 700-deg. F. air blast.

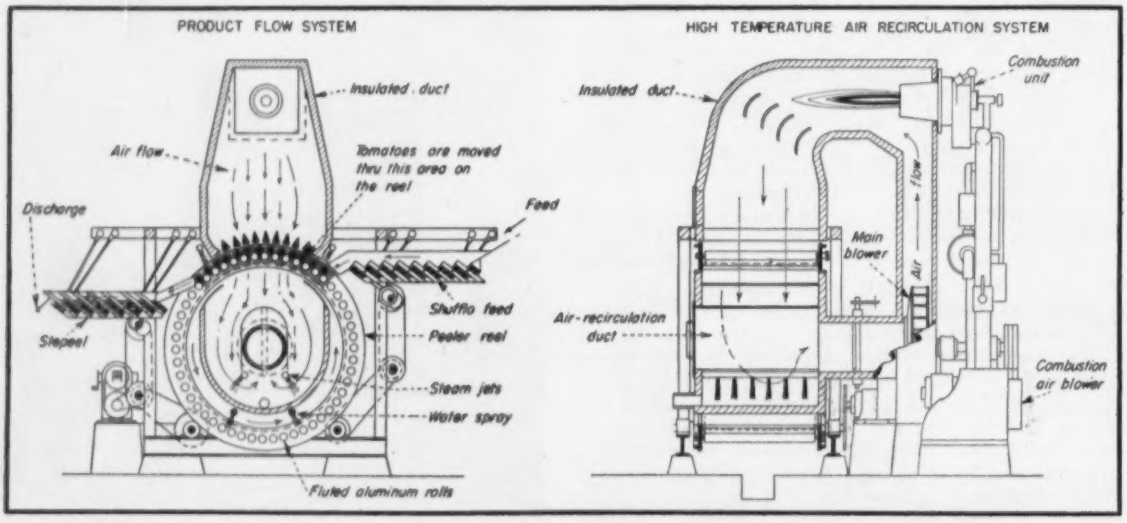
Skins removed in the peeler are feather-light and translucent, having no tomato flesh adhering to them. And any remaining portions of skin are easily hand-slipped from tomatoes at the grading belt.

Previous models of this Hydoff peeler were tried out in Western canneries for two seasons. Then F. M. Wilson Co., Inc., Stockton, Calif., operated the perfected unit, described here, during the entire 1954 season—without shutdown.

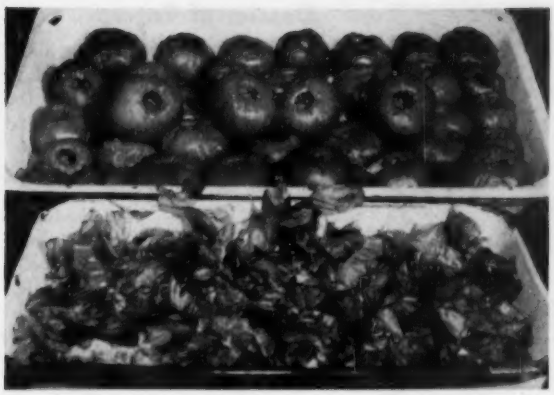
"That the Hydoff completely peels from 10 to 30% more tomatoes than most conventional peelers is not the whole story," reports Mr. David House, president of Wilson. "Of equal importance is the fact that only the paper-thin skin of the vegetable is removed. The layer of tomato flesh directly below the skin—rich in red pigment and high in vitamin C content—is not stripped off by peeling nor by subsequently applied mechanical aids."

Many peeling methods and devices have been developed since the early days of tomato canning. These fall into four broad categories:

1. Hot-water or steam scalders.
2. Chemical treatment (e.g., lye) followed by the application of steam, either at atmospheric pressure or at pressures ranging as high as 60 psi.
3. The application of heat, largely steam, in conjunction with mechanical means for peel removal; e.g., high-pressure water sprays, abrasive rolls, and mechanical knives.



MOVEMENTS of product and hot air through peeler are shown, with construction and operating details.



SKINS from cored and peeled tomatoes are like translucent thin parchment. No flesh adheres to peels.

4. Flame peelers, in which tomatoes are exposed to the dry heat of direct gas flames at 1,400-1,500 deg. F. These were found impractical.

A common factor in all these methods is the application of heat. With water and atmospheric-pressure steam-scalders, temperature is limited to 212 deg. F. It can be raised to 290 deg. F. with pressure of super-heated steam-scalders. The new peeler is the first to utilize the wide temperature range lying between 290 and 1,400 deg. F.

Skins Split, Blown Away

Its operating principle consists of exposing tomatoes, for a very short time, to a 650-700-deg. F. high-velocity wind blast. During this exposure, the tomatoes are gently revolved to expose their entire surfaces to the heated gases. At the instant the high heat causes skins to split and lift away from the vegetable, the wind blast tears them from the flesh in strips.

In earlier models of this peeler, gas velocity was about 200 mph. and exposure time was 10-12 sec. In this new model, velocity has been increased to about 250 mph., with consequent reduction in exposure time to 6½-7½ sec. Despite this reduction in time, increased gas velocity has increased peeling efficiency.

The rated normal hourly capacity of the peeler is 8 tons of tomatoes which have been sorted for coring and peeling.

In three years of operation, the product recovery from this peeler has been consistently higher than that of the conventional unit. The recovery per ton of tomatoes paid for (receiving-station weight) ranges from 36½ to 40½ completed 2½-basis cases (tomatoes plus added juice or puree). These figures are for tomatoes of reasonably good quality and condition. And they are affected by the net weight of peeled tomatoes per can.

Mechanics of It

Tomatoes from the coring belt drop into the feed mechanism, the Shufflo,* which properly positions them for the peeler reel. The Shufflo is a series of eight shelves, set at a 35-deg. angle. Alternate shelves reciprocate, gently pushing the tomatoes from the preceeding shelves and moving them horizontally towards the peeler reel. The last shelf is synchronized with the reel. And when input is sufficient, it feeds a full row of tomatoes onto the fluted aluminum rolls of the reel.

The skin stripper, or Stepeel, operates like the Shufflo with one exception. By cam action, its shelves are operated like "jaws." On their reciprocal return movement, the rubber-lined jaws close to grip loose skins on the tomatoes. Then as the tomatoes are pushed onto the next shelf, the skins are held by the jaws, so that the vegetables actually roll out of their peels.

The trunion-supported, rotating peeler-reel (6 ft. in dia. and 4 ft. wide) is driven by an adjustable-speed motor. It has 51 extruded, fluted, aluminum rolls, each one positively gear-driven for rotation during the full turn of the reel. A stainless steel screen, directly below the reel, collects skins blown from the tomatoes as they move under the air blast. Skins which cling to the rolls and the screen are washed off by water sprays. And the water from the sprays carry all skins to an exit port.

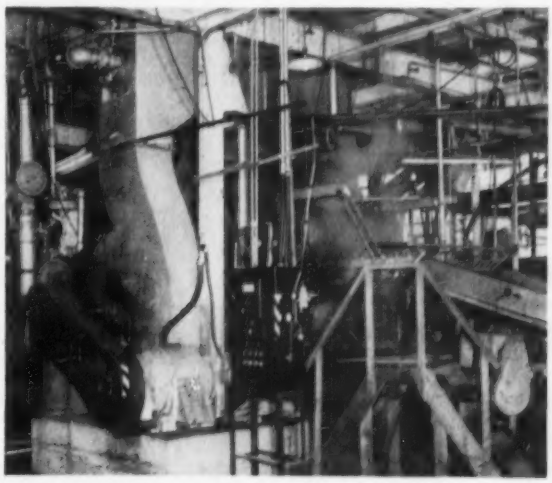
The combustion unit, rated at 3,000,000 Btu. per hr., is automatically controlled to provide the desired air temperature. A blower delivers 670 cfm. of cold air at 32 oz. gas pressure to the combustion unit. This air is mixed in a proportioning device and supplied to the burner. The products of combustion are mixed with the flow of recirculating hot air from the main blower. These gases are inert, consisting largely of carbon dioxide and nitrogen.

The main blower, rated at 10,000 cfm. at 16-in. static head (at 700 deg. F.), recirculates this heated air through the duct system. The air flow moves from this blower, past the flame, and into a plenum chamber. It is discharged from the chamber through slotted openings directly above the rolls carrying the tomatoes. The air is then collected in a suction chamber for recirculation.

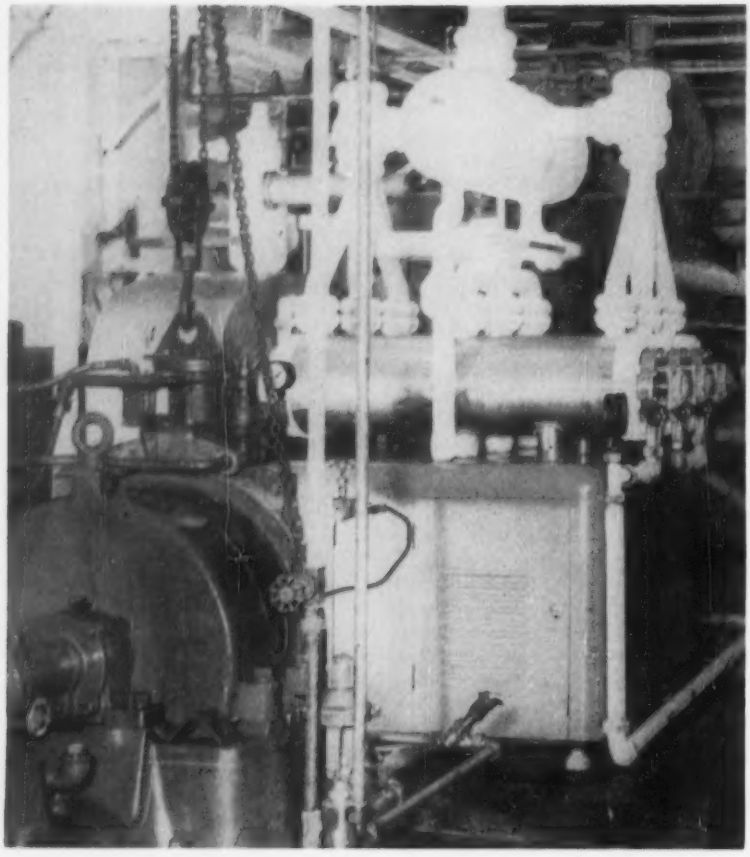
A Cost Saver

On the basis of direct labor cast for corers, peelers, and hand canners of about 81 to 90 c. per 100 lb. of peeled tomatoes, the labor cost per case is said to be considerably below that of other peeling machines or methods. Further, the unit yields a higher quality peeled product, increasing the percentage of Fancy-grade recovery.

Combined fuel and electric power cost for operating the Hydoff is, according to this season's records, a little less than that of the water scalders used previously at F. M. Wilson Co. Power consumption is higher, but fuel consumption is markedly less. Steam consumption is negligible—an important factor in a tomato plant where boiler capacity is usually "on the edge." Natural gas consumption is approximately 800 cf. per hr, or about 42 c. per hr. The machine is easily cleaned, has no inaccessible corners, and is fabricated of non-corrosive metals.



PEELER in plant. At right is product-exit side (partially obscured by steam). Airduct is at left, with combustion unit entering it at top, and main blower motor at bottom.



Dossier of Enterprise

Golden Gift, Inc., was originally formed as a non-profit organization to operate under patents owned by Dr. George Sperti of the Institutum Divi Thomae, Cincinnati, commonly referred to as the I.D.T. Foundation.

Under a Sperti patent, the company developed a process for producing fresh orange juice for long-distance shipment by first subjecting it to a high intensity ultraviolet irradiation treatment, then pre-cooling for transportation in refrigerated trucks (FE, Nov. '52, p. 93). Operation of this process will be continued at De Land.

The company is privately owned, with the new owners and officers having invested a reported $500,000 in development of the high-ester process. President is Andrew P. Young, while S. P. Cole, who was with the original company, is vice-president in charge of production. Hobart Cook is vice-president in charge of engineering and research. And Robert Stivers is vice-president in charge of sales.

HEART of new process comprises Votator (rear) in which freshly extracted orange juice is frozen to slush, and centrifugal dehydrator (foreground) that separates high-ester phase (15%) from ice (85%).

Now—Orange Concentrate With 95% Flavor Esters

Freeze-out combined with low-temperature evaporation achieves improvement . . . Gelation also licked by high-ester processing

C. E. WRIGHT
Food Engineering Correspondent, Jacksonville, Fla.

Retention of approximately 95% of original flavor and fruit sugars is reported in frozen orange juice concentrate now being produced commercially by Golden Gift, Inc., De Land, Fla. Used is a new "high-ester" process.

Gelation, which has been responsible for serious quality and economic losses to many concentrates, is also said to be eliminated by the new method.

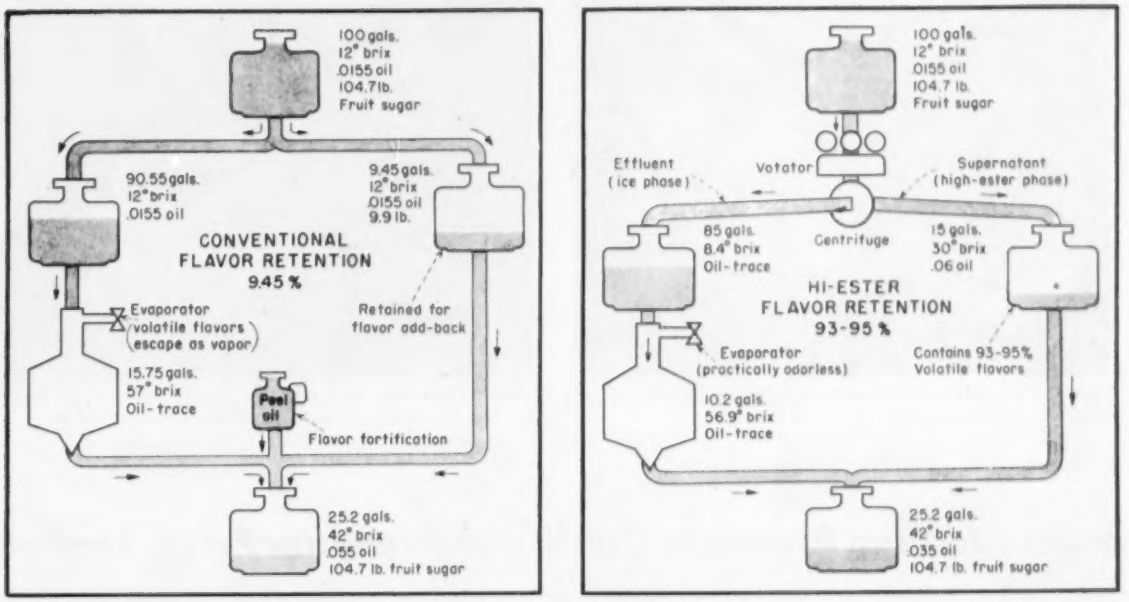
The new procedure employs equipment similar to that used in other concentrating plants. However, it requires additional machinery to freeze and fractionate the juice into the high ester and ice-phase fractions. But evaporator efficiency is increased, enabling capacity to be upped as much as 20% over conventional plants.

The high-ester process originated with experiments in frozen citrus concentrates conducted by Dr. Arthur L. Stahl at the University of Florida in 1938-39. Due to mechanical difficulties and loss of fruit sugars in the ice the process was side-tracked.

In the meantime the "Add Back" process, developed by MacDowell and co-workers, was adopted commercially. And virtually all the frozen citrus concentrate now on the market is made by this process.

This method is so named because of the way in which the concentrate is made. Approximately 90% of the freshly extracted juice is concentrated in a high-vacuum, low-temperature evaporator to a Brix higher than the desired point and then blended with approximately 10% of fresh juice to give the familiar 42 Brix 3-1 concen-

Conventional vs. New Way



IN extensively used "Add-Back" process (left), approximately 90% of juice is concentrated in low-temperature evaporators with almost complete loss of volatile flavors. New process (right) separates essences by freezing, thus retains 93-95% of original orange flavor. Note (below) schematic of new method.

trate. The add-back juice imparts fresh flavor to the concentrate to partially compensate for that lost during evaporation.

Theory Behind New Method

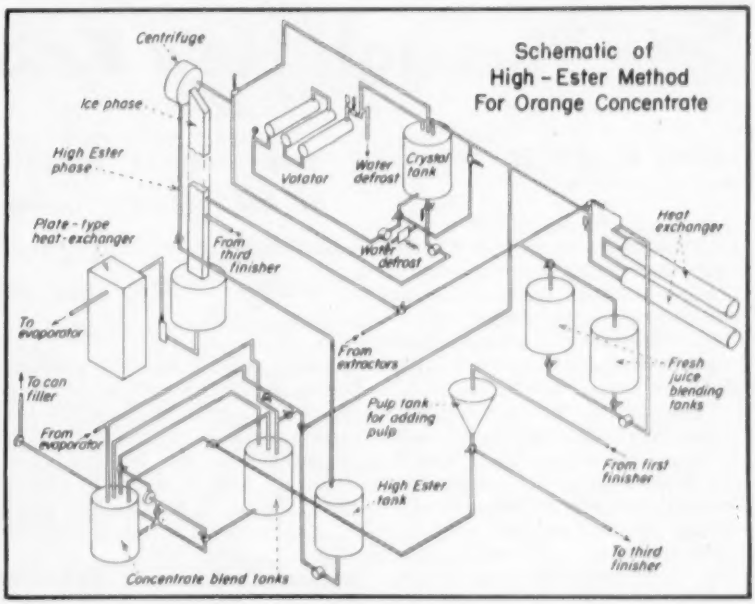
Basic theory of the high-ester method is explained by Hobart Cook, Golden Gift's vice-president of engineering and research—

"Loss of flavor, the bugaboo of the citrus concentrate industry, has necessitated a variety of counter measures, but with disappointing results in almost every case. And so-called 'ester recovery' attempts have been singularly unsuccessful.

"It has been determined that flavor of orange juice results from the presence of aromatic volatile oils that have characteristically high vapor pressures. These oils, therefore, are almost entirely lost when the juice is subjected to concentration under vacuum. When attempts were made to recover them from the vapor, the entire spectrum was never recoverable. Flavors were incomplete, unnatural, and untrue.

"It was obvious, therefore, that concentration which did not require heat or vacuum was the best direction for experimentation. The most logical alternative appeared to be the "freeze-out" method which, by application of low temperature, reduces the vapor pressure of the esters."

To carry out these theories on a practical basis, Golden Gift established, at Eustis, Fla., the minimum size plant that could, in its opinion, be operated commercially with the freeze-out method.



It did not lose sight of the fact that there has been one famous failure of a large-scale attempt to produce orange juice concentrate by this method.

"This failure," states Mr. Cook, "was a result of economic factors rather than of product shortcomings. Probably no more true and full-flavored concentrate was ever produced," he says, "but a considerable amount of fruit sugars remained in the discarded ice. This economic barrier proved too great, and the enterprise was abandoned."

In laying out the Eustis plant, Golden Gift drew on the citrus processing experience of the following equipment suppliers: Food Machinery & Chemical Corp., Lakeland; American Machinery Corp., Orlando; and Gulf Machinery Co., Clearwater, Fla.

(Turn to page 207)

SHRIMP pinned on racks and flash frozen individually in —60 deg. air blast do not stick together.

FISH STICKS are precooked in electric oven after breading. Heaters raise for cleaning. Wells collect crumbs.

With Idea for Premium Quality at Premium Price, SeaPak

Achieves Quick Success Through New Know-How

FRANK K. LAWLER
Editor, Food Engineering

Keeps cost of quality reasonable with advances in size grading, peeling and deveining, freezing, packaging, cutting, breading, and precooking. Strict quality control and sanitation practices followed

It all started with an inspired idea six and a half years go. The idea was that people would pay a premium for fine quality frozen shrimp—a delicacy packed to a gourmet's taste.

The idea came to two ex-newspapermen who had lately turned fish dealers at St. Simons Island, Ga.

Perhaps it was the critical attitude of the men from the press that made them see the opportunity for better quality through better processing and freezing methods. Maybe it was the insight of the newspapermen into consumer tastes and buying habits that crystallized the concept that premium quality at premium price could be parlayed into profit.

Whatever the motivating forces, the business founded on a shoestring by Jaxon Hice and James Meadows has developed into the highly successful multi-plant SeaPak Corp. which should gross better than eight million dollars in 1955.

But it didn't happen just like that. There were some reverses. During the first of these, J. Roy Duggan, an Atlanta printer trained as an accountant, came into the firm as a reinforcement. And there was a battle from the beginning to lick technical problems. Techniques and equipment had to be devised to attain that qaulity level which policy had established as the cornerstone of the business. Then efficiency had to be introduced all along the line to produce that quality at a price which, though a premium, was still a good buy.

Establishing effective distribution methods was another of the essential building blocks. And product promotion that rang the buying bell had to be created. When it comes to the latter, Jack Hice has the master's touch.

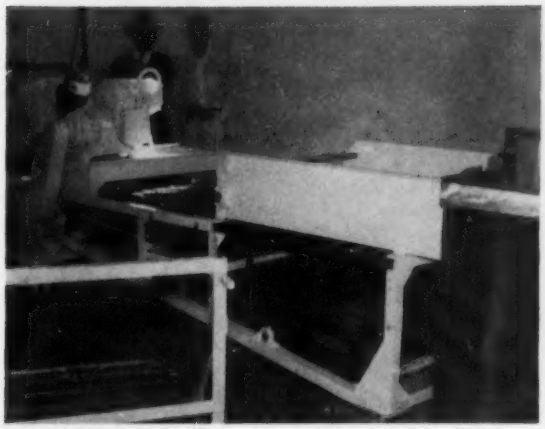
But here we shall stick to the story of quality and production-line efficiency—of enlightened policies, advanced practices, and innovated equipment in the St. Simons Island plant. Therein is a story with meaning to processors far removed from the fish industry.

Super-fast freezing was SeaPak's first technical contribution to progress in shrimp processing. And for this it received several patents in 1953 and '54.

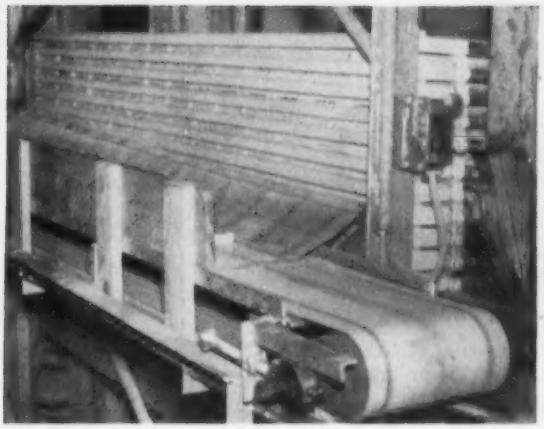
This so-called "flash" freezing was conceived to improve quality. It brings product temperature down through the critical freezing range of 32 to 22 deg. F. so fast that ice crystals are kept very small. Thereby structure is not damaged, and "drip loss" upon thawing is reduced to insignificance. Freezing takes only 2 or 3 min. And the products are processed to be cooked frozen.

SeaPak also wanted to provide consumers with packages in which the shrimp were not frozen to each other. This would permit use of any desired number without thawing the package.

To do all this, the shrimp are frozen in a —60 deg. air blast while individually suspended from racks by their tails. A daring innovation from the viewpoint of production-line costs, it



STACKER feeds stick trays under end of cooker discharge conveyor for automatic loading.



FREEZER for sticks is of compression-plate type and is loaded and unloaded by pusher mechanism.

has been efficiently achieved by an ingenious company-developed pinning line.

This line consists of two chain conveyors, one above the other. The top one carries pans of peeled and deveined shrimp. The bottom handles empty aluminum racks with detachable rails to which small stainless pins are attached. At a level between the two conveyors are supports to hold the rails while the shrimp are hung on the pins, as well as shelves on which pans of shrimp may be set.

Thirteen girls work on each side of this 30-ft. pinning line, and each pins as many as 125 racks in 8¾ hr. Equipped with 13 rails, 25 pins to the rail, a rack holds 325 shrimp spaced about 1 in. apart each way.

The bottom side of the top conveyor chain takes empty pans to the end of the line for washing in chlorinated water before refilling. The top chain of the bottom conveyor moves filled racks to the end of the line for breading and freezing.

Products which cannot be pinned to rails, such as breaded oysters, are flash frozen in single-layer pans.

Mechanical Peeler-Deveiner

There are other mile-posts of progress in the shrimp operation.

One is the battery of 12 machines which peel the irregularly shaped shrimp and take out the vein—at a rate of 125 lb. per min. per machine for medium to large shrimp. Built by Miller, the peeler-deveiner is fed manually, one shrimp at a time, through an oval opening.

Two small belts running face to face catch the shrimp and move it against knives and a water jet. The knives take the peel off and the vein out, but leave the tails on for the fantail brand. The jet washes waste to a flume. And peeled shrimp discharge into another flume that takes them to a series of spray-wash conveyors and inspection belts.

TECHNOLOGIST Thomas Armstrong makes daily tests in lab to maintain quality.

HOME ECONOMIST Carol Ann Davis develops new recipes for products in plant's modern kitchen.

These machines save a lot of man-hours. Using eight of them on a shift with a total of 36 workers—machine feeders, inspectors, supervisors—SeaPak peels as much shrimp as 90 to 100 workers formerly turned out by hand operation. And further improvement on these already favorable cost comparisons are anticipated.

SeaPak also has under lease and in use at its St. Simons plant, and the Tampa plant of its affiliate, Shoreline Packing Corp., machines which remove all peel, including the tail joint. These are Johnson Shrimpmasters.

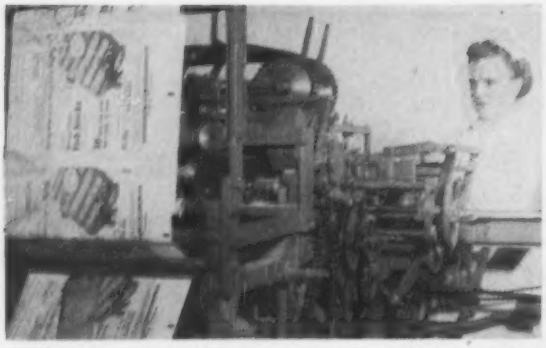
While the peelers pay off, they must be backed up by inspectors to remove any peel or vein missed by the machines.

Another work saver at SeaPak is a machine which sorts shrimp into four sizes to permit packing of a uniform product. The grader consists of two sets of inclined elliptical rollers arranged in two pairs, one below the other. The spacing between rolls increases as the shrimp move along, and the different sizes drop at different points into chutes. The rotating elliptical rollers keep the shrimp bouncing along the 15-deg. incline until they fall through the space, avoiding a jam up. Normal run through the 10-ft. Sortrite grader is 2,500 lb. an hour, but as much as 4,000 lb. can be handled.

YOU'LL FIND a graphic 4-page Fold-out Flowsheet of SeaPak's advanced production lines on pages 118-121.

Efficient Breading

Ingenuity on the part of the company's plant manager and engineer is reflected in the shrimp battering and breading operations. Batter is contained in a waist-high pan with a horizontal center section and upward sloping wings on either side. A rack of tail-suspended shrimp is placed on supports over the center section, immersing the shrimp, but not the rack, in batter. Then the rack is slid onto



COLORFUL, informative wrappers are applied to cartons at 60 a min. by this machine.

PORTABLE power conveyor loads semi-trailers from sub-zero storage. Has total and batch counters.

one of the inclined wings to drain.

To apply the breading mix, the rack is transferred to a box, where it rests on supports to permit the shrimp to hang downward. Breading is scooped over the entire rack, and a coating adheres to the batter on the shrimp.

For good appearance, the shrimp are twice dipped in batter and covered with breading. Yet SeaPak applies no more breading than top quality dictates. By independent test, its product contains from 25 to 30% more meat than the average of 30 other brands. Nine men handle the breading operations.

It formerly took a lot of labor to pack the frozen shrimp into cartons. So ingenuity came up with a conveyorized packing table. This enables 18 packers and 4 weighers to put through 800 to 1,000 lb. per hour of the 3-lb.-carton institutional pack—something less for the retail pack.

Special Packing Conveyor

This speed-up packing conveyor has a 30-in. rubberized convas belt which carries shrimp past the workers, the shrimp being dumped from the pin racks onto the protruding main belt (jostling against the belt unpins them).

Empty cartons stand on a rack atop the packing belt, within easy reach. A 10-in. overhead belt travels down each side of the packing table to carry filled cartons to the end of the line.

Shrimp of uniform size are counted into the cartons, and both count and weight are marked on the container for consumer convenience. Grading is so close that there is no more than a two-shrimp variation in the count per pound.

After the cartons are filled, retail sizes are closed and wrapped on a 60-per-min. Package Machinery unit. Institutional cartons are hand-wrapped and heat-sealed by five incentive-paid girls. After one girl deftly wraps paper around a carton and slides the overlap across a hot plate to make the seal, she tosses the package to another who quickly folds the ends and rubs them across another hot plate.

Wrapped cartons are cased by hand and sent to sub-zero storage.

It is interesting to note that the shrimp are so frigid when brought to the packaging belt that they must temper at room temperature before being depinned. Otherwise they would shatter in the depinning operation. They remain hard frozen all the way through the packaging operation.

Completing the efficiency engineering in the shrimp operation are continuous washing and inspection belts. Everything keeps moving.

Achieving Premium Quality

Premium quality products are not produced through advanced production-line methods alone. And therein lies another key phase of SeaPak's operations.

With any food, quality starts with the raw material. So the company not only purchases select, sea-fresh, raw shrimp but it carefully checks the quality of incoming truckloads, even to bacteria counts. It buys only from producers who consistently deliver top-flight shrimp. On occasion it has spotted conditions which cause contamination in the green shrimp plants and effected their correction.

This is one place where the plant laboratory and food technologist pays off. But big dividends also come from close checking and control of finished product quality, and plant, equipment, and worker sanitation in the SeaPak plant.

This enables the firm to sell finished products with one-sixth to one-tenth the bacteria count normal for the trade. It also enables it to avoid any contamination with coli or streptococci —real troublemakers. And the technologist goes to bat, too, if any complaints come from distribution channels as a result of improper storage or handling.

The lab regularly takes swabs off of equipment to spot any bacteria build-up, and corrects unsatisfactory conditions. It discovered that bacteria grow on shrimp-handling belts unless the belts are scrubbed with a brush. Such a condition would spread bacteria throughout the plant.

Contributing considerably to the quality of the finished products is the use of in-plant chlorination. Water in which shrimp are handled and washed is chlorinated to 10 ppm. The dose is a heavy 50 ppm. in clean-up water.

Strict Sanitation

Cleanup is a more or less continous job. Equipment is hosed at mid-shift work breaks. An hour and a half is devoted to cleaning between shifts. Then at the end of the second shift, belts are scrubbed with brushes, and a thorough sanitation job is done. One pleasant witness to the effectiveness of these procedures is the fact that there is no fish odor in this seafood plant.

Quick History

Founded early in 1949 on St. Simons Island, Sea Island Packing Co. became SeaPack Corp. in August, 1949. A year later it absorbed Aero-Foods, Inc., which had been organized earlier to handle institutional sales.

In 1951 the company acquired a second plant at Valona-by-the-Sea, Ga., and the following year formed an affiliated company, Fortune Bay Products, Ltd., at Fortune, Newfoundland. Construction of this company's million dollar flash-freezing plant was completed in 1953. And in that year SeaPak helped to found another affiliate, Shoreline Packing Corp., Tampa, Fla., which built a flash freezing plant there.

With a total freezing capacity of 25 to 30 million pounds a year, these four plants are new and modern. And production at each point is on a year-'round basis, the pack varying with the seasons.

MECHANICALLY REFRIGERATED to sub-zero, semi-trailers carry frozen seafoods to distant markets. In summer, 500 to 1,000 lb. of dry ice per load gives added protection.

Strict attention also is paid to employee cleanliness. Before going on the job, workers wash their hands with a bactericidal soap and dip them into a basin of 50-ppm. chlorinated water. Hands are dried on paper towels from convenient dispensers.

Sub-Zero Transportation

Final, but highly important step in controlling quality comes in shipping the products to market. From storage at −5 to −10 deg. F., the frozen seafood is loaded into semi-trailers refrigerated to zero or below with Thermo-King or Carrier mechanical units. And in summer months, 500 to 1,000 lb. of dry ice is placed on top of each 24,000 lb. load to make sure that the product will be kept below zero during a three-day run, even though the trailer doors are opened for unloading at points on the route. The $22.50 to $45 cost of the dry ice is considered cheap insurance against product damage by warm-up in transportation.

Trucks which haul SeaPak products are owned by the drivers, assuring proper care of the load in route. And for efficiency, the trucks carry supplies on the return run, such as frozen fillet blocks from which are made breaded fish sticks (see special story following).

A portable power conveyor speeds loading and unloading of the trailers at the plant, this being assisted by power lift trucks operating in the freezer storage room. The conveyor is equipped with two counters. One makes a total count of cartons loaded. The other counts individual orders. And the two counts must be precisely the same.

Advanced Unit Operations Engineered for Fish Sticks

New cutting, breading, cooking, cooling, packaging, and freezing units employed

There also is a lot of advanced know-how in SeaPak's new continuous breaded fish stick plant. It starts with cutting and continues through the line to freezing.

Two Biro bandsaws cut the 17½-lb. blocks of frozen cod fillets into 3½x ⅞x1⅛-in. slabs, which are inserted endwise into a reciprocating cutter, four at a time. Reciprocating at 50 strokes a minute, the knife of the Weber cutter chops off 200 sticks a minute without producing "sawdust." At the same time sticks are being produced on a third bandsaw at a rate of about 200 a minute.

Sticks from the cutter fall onto a sanitary rubber belt, travel past inspectors, continue under two falling streams of pump-recirculated batter, and enter a rotating breading cylinder. Spiraled baffles in this cylinder move the sticks to the exit after a few turns, by which time the batter-coated sticks have picked up the right amount of breading mix. A slide in the center of the cylinder slopes counter-current to the production line flow to catch and return excess breading mix to the intake end of the cylinder for another pass.

Electric Deep-Fat Cooker

Breaded sticks come out of the tumbler onto a vibrator which shakes off loose crumbs, then the sticks move along a wide wire-mesh inspection belt and into a deep-fat precooker. A wire-rod conveyor, immersed in the 375-deg. oil, carries the sticks through the cooker in 78 sec. A chain conveyor with cross flights operates at oil level to move any floating sticks along.

Electrically heated with four 220v. immersion units, this cooker draws 780 amp., generates a million Btu., and has a higher capacity than its 1,000-lb. rating.

Specially designed by Downyflake (division of Doughnut Corp. of America), the cooker is built for easy cleaning. Levers raise the heating elements to permit quick daily cleaning of the cooker tank.

CARTONS set up by machine feed to stick packing-line conveyor. Tray of sticks goes onto lower conveyor.

SANITATION is serious business at SeaPak. Uniformed workers wash with sanitizing soap, rinse hands in 50-ppm. chlorinated water.

Another important cooker feature is the series of cold wells in the tank below the heating elements. Loose breading crumbs fall out of the hottest zone into these wells, and are not churned up into the oil.

Pre-melted make-up vegetable shortening is pumped to the cooker from a 3,000-lb. electrically heated tank alongside. And drums of the cooking fat are emptied into this melter from an electrically warmed rack.

At the end of a run, oil is run from the cooker into a small portable tank covered with a thick cheesecloth filter over a wire-mesh screen, then pumped into the melter.

Like the battering and breading equipment (also made by Downyflake), the product-contact parts of the cooker are of stainless steel. So is a large ventilating canopy over the cooker. In the discharge ducts of this canopy is a suction fan that exhausts 9,500 cfm. of air to keep cooking vapors out of the plant.

Automatic Tray Loader

After the cooker comes another innovation. It is a Downyflake automatic wire tray stacker that feeds one tray at a time under the end of the cooker discharge conveyor for automatic loading. Filled trays are manually placed on a portable rack and pushed into a cooler to bring the temperature down to 70 or 75 deg. prior to packaging. A York unit cooler maintains a product-to-air temperature differential of only 15-deg. in the 13x11-ft. cooler to avoid drying the sticks.

Even the carton packing table to which the cooled sticks go next is new. It has three conveyors, one above the other, and waist-high shelves along each side. Trays of sticks are carried on the lower conveyor. Empty cartons set up at a rate of 96 a minute by a Kliklok machine move along the top conveyor. And cartons that have been hand filled on the shelves are placed on the center belt.

This belt discharges onto an inspection and check-weighing belt, which feeds the conveyor to the carton closer and the 60-per-min. Package Machinery wrapper. Twelve girls are on the packing line. A second breading line at SeaPak produces fish sticks which are not pre-cooked.

High-Efficiency Freezer

Now we come to another advanced operation. Wrapped cartons are belt conveyed crosswise of the opening into a plate freezer. When 14 are in place, the push of a button operates a loader that shoves the packages between the freezer plates, and simultaneously pushes a row of frozen cartons out the other side of the freezer onto a discharge belt.

A specially designed 20-station Knowles freezer, it consists of a vertical stack of contact plates which automatically move up one station when one plate is filled. When the bottom plate is full, the entire unit lowers so that the top plate, first loaded, is ready for reloading.

Refrigerated to —40 deg. F. by direct expansion of refrigerant inside them, the plates move together to form compression contact with top and bottom of cartons, and they freeze the product in 30 min. or less.

Each freezer plate holds 6 rows of cartons, 14 to the row, for a total load of 1,680 packages.

More Improvements Coming

SeaPak has still more innovations in mind for the fish stick plant. It plans to build a balcony servicing area at one side of the floor. There, cartons will be set up and chuted to the packing lines. A ramp supported on overhead trusses will permit breading mix to be wheeled across and dumped into 100-lb. hoppers at the machines.

A mezzanine to be constructed on the other side of the floor will support the batter mixers, the batter being piped down to the production lines.

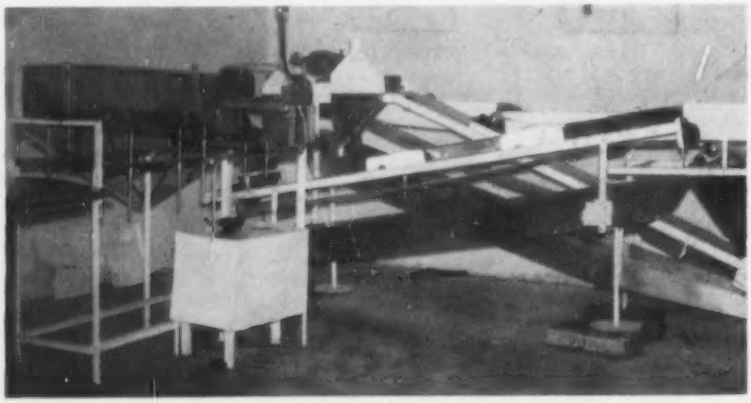
And an overhead belt will convey supplies from a nearby warehouse.

Construction Features

Skyward expansion is provided for in the construction of the stick plant. The roof over the 80x72x14-ft. plant area is supported by I beams and junior bar trusses strong enough to support a second floor.

Walls of the building are concrete blocks, reinforced every eight courses with lintel block and tie rods. Walls are lined with cement plaster, and the floor surface is dense concrete. To keep out heat of the Southern summer sun, 2 in. of Celotex insulation is installed under the roof.

Electricity to power the machines is supplied by overhead bus-ducts, with take-off taps and heavily insulated cable drops at points where power is needed. Outlet boxes can by quickly plugged-in every 6 ft. along the ducts. And the entire system is so well grounded that the only damage was one burned out switch box when lightning struck the plant.



OYSTERS are breaded on this machine. Batter sprays over oysters on wire conveyors. Breading discharges onto belt carrying battered oysters, and workers roll oysters in it. Excess batter and breading are recirculated.

From forming unit . . .

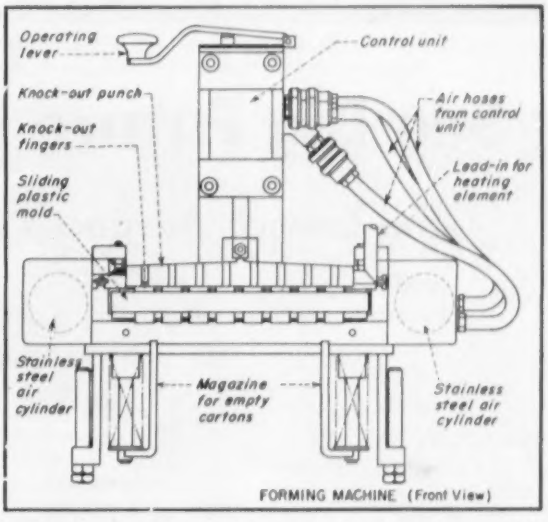
SAUSAGE meat is forced from stuffer (right background) to molder. Links are ejected eight at a time.

. . . direct to package

UNIFORM links go right into attractive "wallet" carton. Having no casing, they're specially tender.

Pnuematic Molder *Quickly Shapes Product Portions*

New air-operated machine produces 280-400 rectangular-type skinless sausage links per minute, then ejects them directly into cartons. . . Forms other products, too



DETAILS of new former. It's easily adjusted, also is readily disassembled for cleaning.

FE STAFF

A simply-designed, pneumatically-operated forming machine, hooked up directly to a stuffing unit, is now producing 1,500-2,000 packages of skinless sausage links per hour.

Slotkowski Sausage Co., Chicago meat processor, has recently installed one of these stainless steel machines in its sausage kitchen, where the equipment repeatedly forms eight uniform 1-oz. sausage links at a time and deposits them into wallet-type window cartons.

Links are molded into a 3x$\frac{3}{4}$x$\frac{3}{4}$-in. rectangular shape so that they will not roll in a skillet, grill, or broiler.

Molds on the new machine (developed by Basic Food Materials, Inc., Vermillion, Ohio) can be interchanged in about 1 min. to form and package hamburgers; chili burgers; liver, bacon, lobster, crab, or clam cakes; and fish, ham, veal, liver, chicken, turkey, corned beef hash; or mock-chicken patties. Available are molds that will form four 2-oz. and two 4-oz. patties.

Sausage meat is first held over night in a 32-deg.-F. cooler so that it is of the right consistency for efficient handling on the forming machine.

Machine is powered directly from the air line that furnishes pressure to the sausage stuffer. When readied for operation on the stuffing table, the unit takes up a space of but 18x19x29 in., and it is set only 12$\frac{1}{4}$ in. from the sausage stuffer.

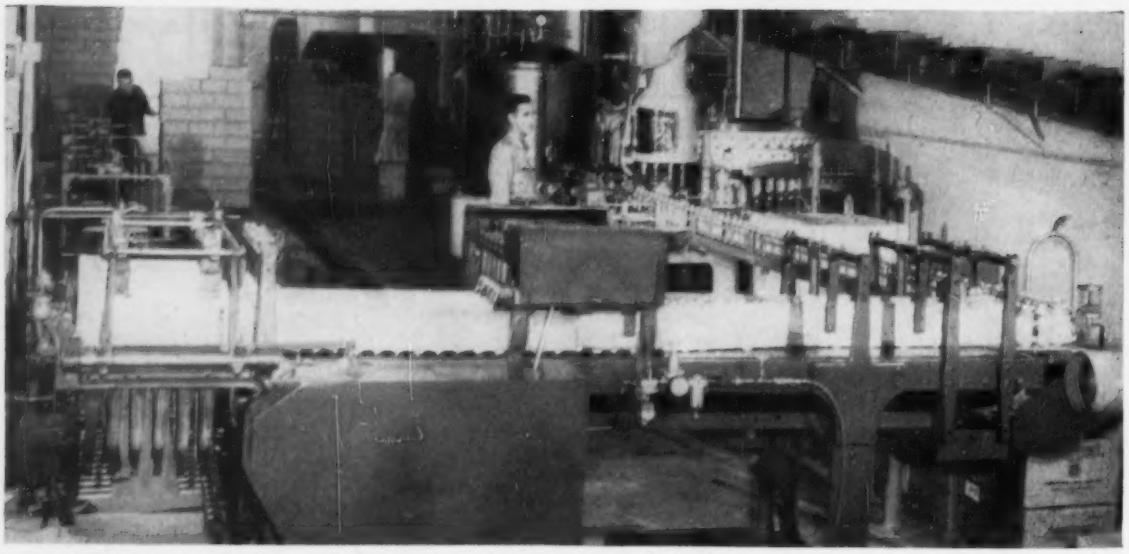
A hand-operated lever automatically starts the forming machine. This lever triggers a valve to send compressed air through vanes in the control unit. Compressed air then continues through lines to two stainless steel cylinders, one on each side of the machine. In these cylinders, pistons further compress the air.

In operation, sausage is forced (under 100-psi. pressure) from the cylinder of the vertical stuffer, through a 2$\frac{1}{4}$x15-in. plastic hose to the molding machine's enclosed feed chamber (2$\frac{1}{4}$x3x7$\frac{1}{2}$ in.). Sausage meat then goes from the feed chamber into the eight forming dies on a horizontal reciprocating-type plastic molding board ($\frac{1}{4}$x9$\frac{1}{2}$x13$\frac{1}{2}$ in.).

Packaging Action

A momentary touch of the operating lever then releases compressed air through the air vanes and cylinders.

(Turn to page 208)



FILLING LINE features latest equipment units in U-shape layout that minimizes floor space and cuts labor.

See Big Future in Canned Drinks

And Launch Advanced Lines to Back Their Belief

Florida interests set up model canning plant to produce Donald Duck beverages. Plan nation-wide chain, also Latin American export

PORTER V. TAYLOR
Special Correspondent, South Miami, Fla.

Although many soft drink bottlers tend to disparage the idea of a canned product as a novelty flash in the pan, there are some who see a promising future for these canned drinks.

One of these is Jack Harkins, president of General Beverages Inc., Chattanooga, Tenn., whose company has planned a nation-wide chain of eight soft drink canning plants. One is already operating in Miami, a second will soon be in production at South Bend, Ind., and a third is under construction at Monterey, Calif.

The Miami division, called General Beverage Sales of Florida, is owned and operated by a group of local men with wide experiences in the soft drink and brewing fields.

Product made here bears the famous Donald Duck name and insignia. It is packed in 12-oz. cone shaped cans lithographed in different colors to indicate the flavors. Now being made are cola, orange, grape, root beer, and strawberry, with lemon-lime and two other fruit flavors to be added soon.

Equipment in the new 15,000 sq. ft. plant is said to be the most modern and scientifically developed in either the canning or bottling fields. And the plant layout was engineered for maximum operating efficiency.

This facility has its own water treating system (Potter & Rayfield) with a capacity of 1,500 gph.

Syrup is made and stored over night to age, using one 1,000-gal. and three 500-gal. stainless steel tanks. Other equipment includes a Meyer deaerator and Syn-Cro-Mix system, Mojonnier Carbo-Cooler, 40-spout Meyer filler and crowner, Canco check-weigher, Standard-Knapp case packer and carton sealer.

Cans arrive in cardboard cartons holding either 24 or 48. These are dumped onto the unscrambler that starts the cans through the filling line. At this time the empty cartons are placed on a belt conveyor that runs over and above the filling line, discharging them to the case packer.

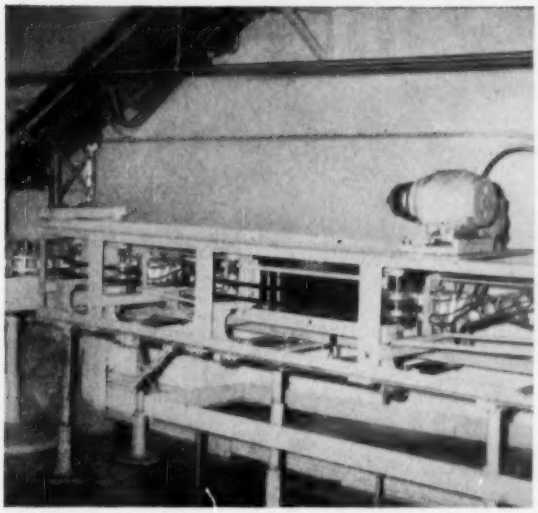
Cans go from unscrambler to a rinser, then to the filler and crowner. After they leave the filler the cans move on to the check-weigher, which rejects light ones. Next, they proceed under hot water sprays and into a tank of 140-deg.-F. water. Then blasts of air remove water and dry the cans.

The latter steps are very important, because the beverage is filled at a low temperature that would cause the cans to sweat when stored at room temperature. This could produce rusty cans and, also, cause the cartons to disintegrate.

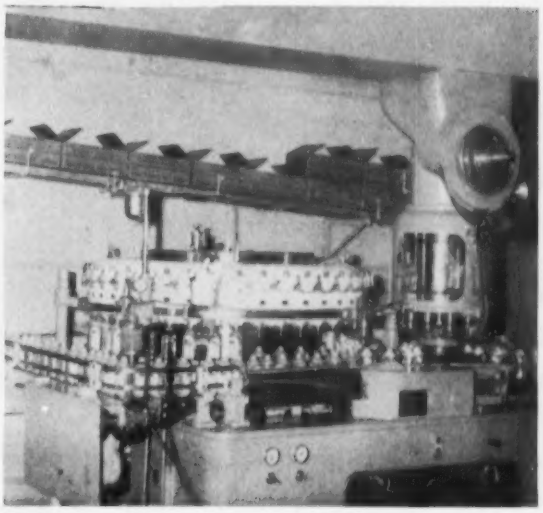
Dry cans go to the case packer, which automatically assembles them in lots of 24. Final operation here—transferring to cartons—is controlled manually. This enables packing of either 24 or 48 to the carton. Sealing follows, then cartons move on a short conveyor to the assembling area. Here they are transferred to pallets, which are moved by fork trucks to storage or loaded onto delivery trucks.

At present, a fleet of 10 trucks distributes the product to retail outlets in the Miami area. However, Latin American trade is being solicited, featuring the combination of the Donald Duck name and cheap water transportation. And this is seen bearing promise as a profitable venture.

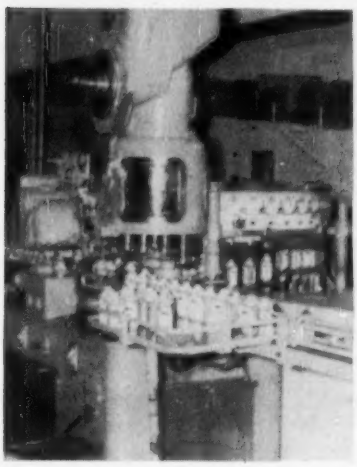
From Carton Back to Same Carton in 6-Step Canned Pop Line



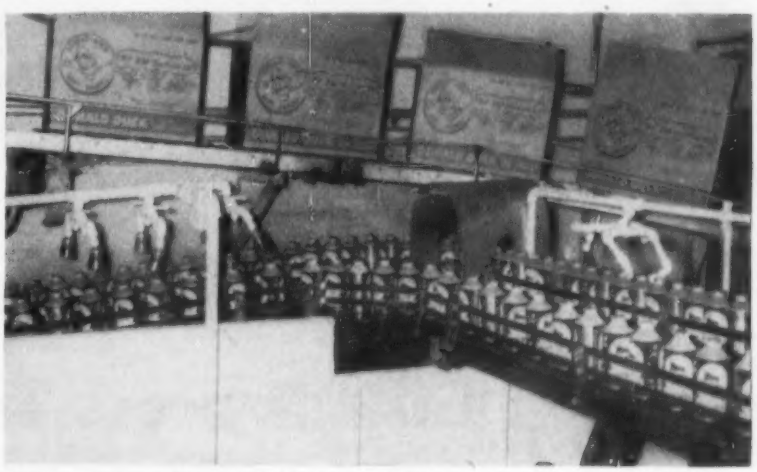
1 Empty cans are dumped on unscrambling table (left), then get rinse in unit (foreground).



2 Cans are filled and crowned. Empty cartons are conveyed (rear) from unscrambler to caser.



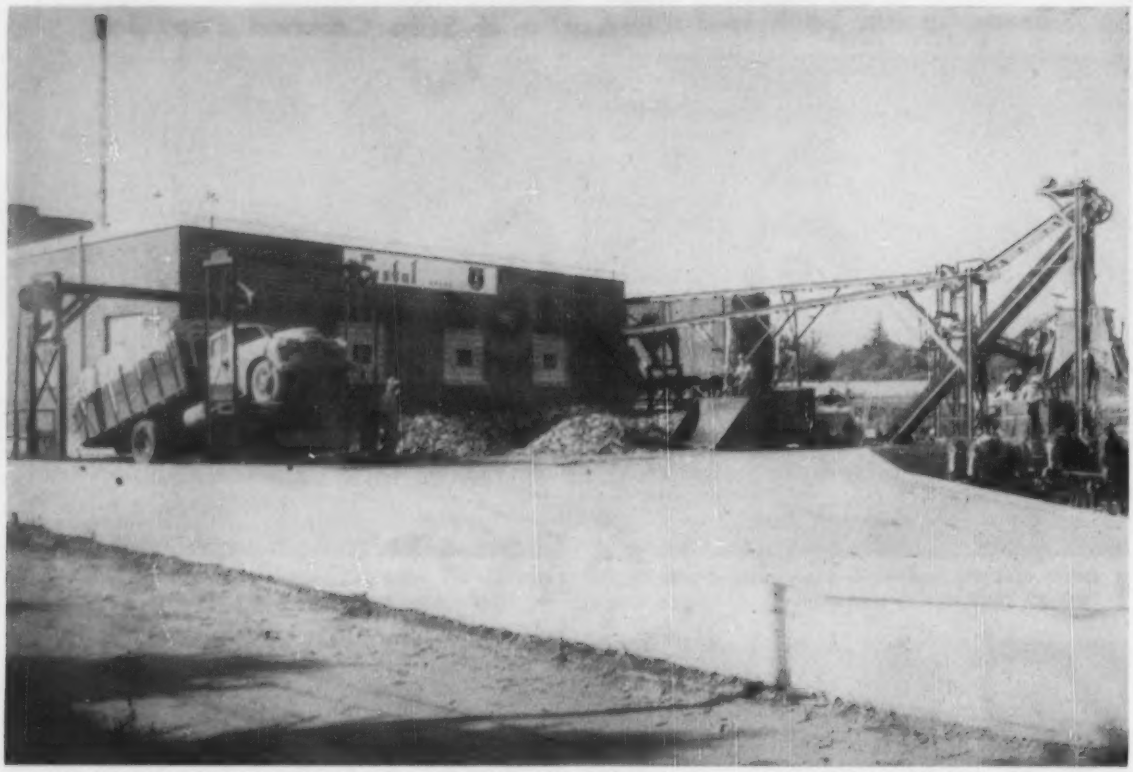
3 Check-weigher kicks partially filled cans from conveyor onto table (foreground).



4 Filled cans are sprayed with hot water (front row at left), make U-turn and get sprayed again (rear), pass through tank of hot water (center), then are dried by air blasts from pipes (right).

5 Cans are packed (24 or 48) in cartons from which empties were removed at start of filling line.

6 Palletized handling of cartons of empty and full cans enables maximum use of storage facilities.



1 **TRUCKS** haul ear corn, most of it harvested from company-owned farms, to unloading ramp at plant dock. There electric hoist elevates front end of vehicle to empty contents.

Streamlined Handling Cuts Process Time

Cream-style corn produced in less than one hour with improved conveyor system. Quality and worker productivity improved

Advanced materials handling equipment for canning cream-style corn has been installed at Goodhue Canning Co., Kenyon, Minn. In operation in time for processing the 1954 crop, the new conveyor system proved to have these economies and advantages:

- **Time required to process cream-style corn has been reduced to one hour or less.**
- **Work tasks have been simplified so that minimum physical exertion is required of employees.**
- **Production per worker and per unit of work space have both been increased.**
- **Improved finished-product quality has been assured.**

Except for a minimum of manual operations, the product is processed continuously—from the time it is dumped at the plant dock until it is in the can and ready for retorting.

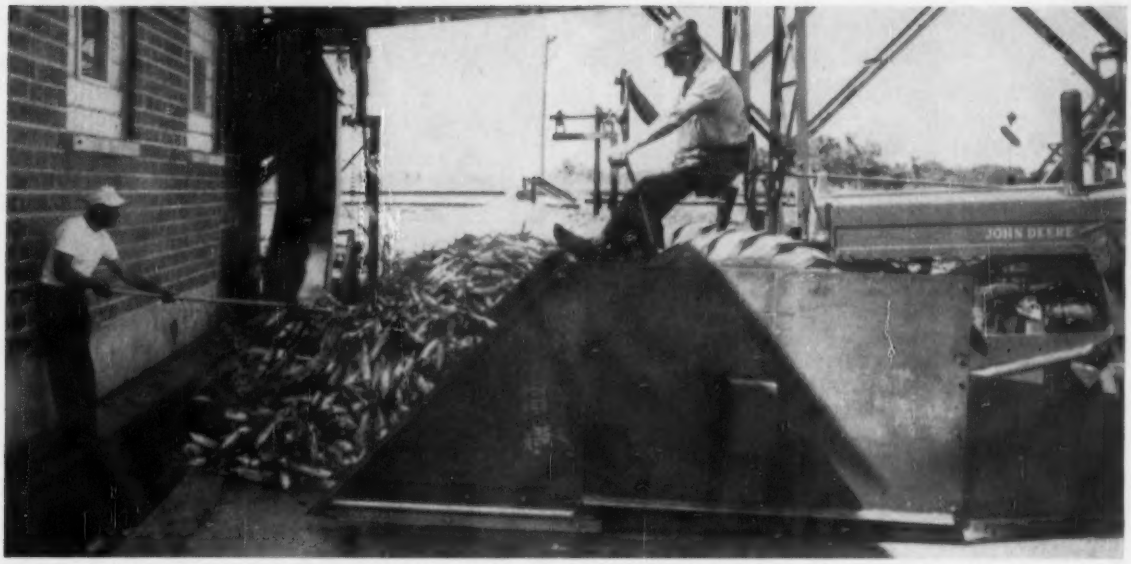
The operational steps where streamlined materials handling has aided processing are shown, in sequence, in the accompanying pictures.

Since processing at Goodhue is an uninterrupted operation, there is no need for storage capacity of any kind anywhere in the plant.

For this uninterrupted sequence of materials handling operations, various conveyors are employed. Two slat-type flight conveyors, each 24 in. wide, carry the ears of corn into the plant. And three similar conveyors carry away the silage. A belt conveyor distributes the corn to the six huskers. Three belt conveyors carry the cream-style corn and one the cobs. In addition to the belts, two screw conveyors also employed, one for cream-style corn and one for cobs.

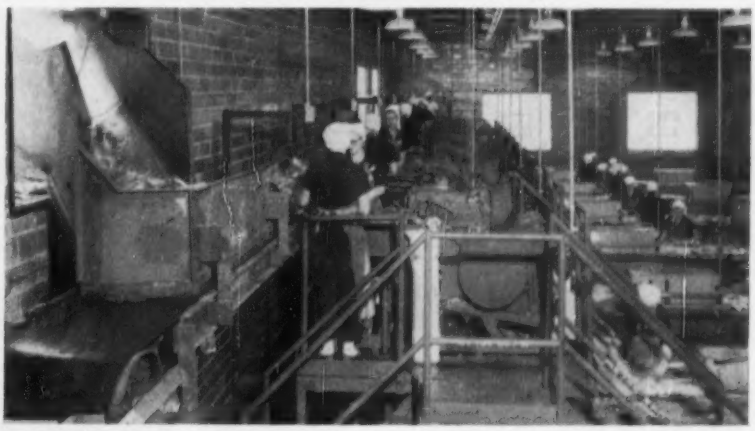
Six traveling roller inspection conveyors, each about 10 in. wide and 20 ft. long, carry the ears from the huskers to the cutters. Carried on chains, the rollers turn and gently rotate the ears. This simplifies inspection and facilitates more thorough spray washing. It is at

(*Turn to page 168*)

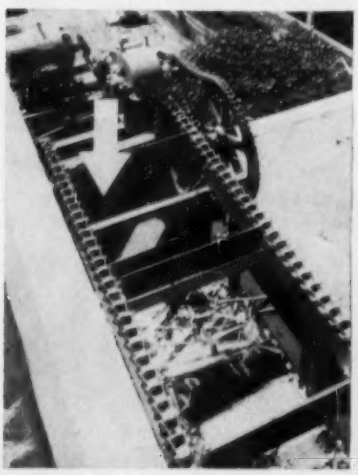


2 **EAR CORN** supply accumulates on plant unloading dock. Then it is plowed by a single operator into submerged, 24-in., flight-type conveyor. Unit is ample for plant capacity of 7,000 cases per day.

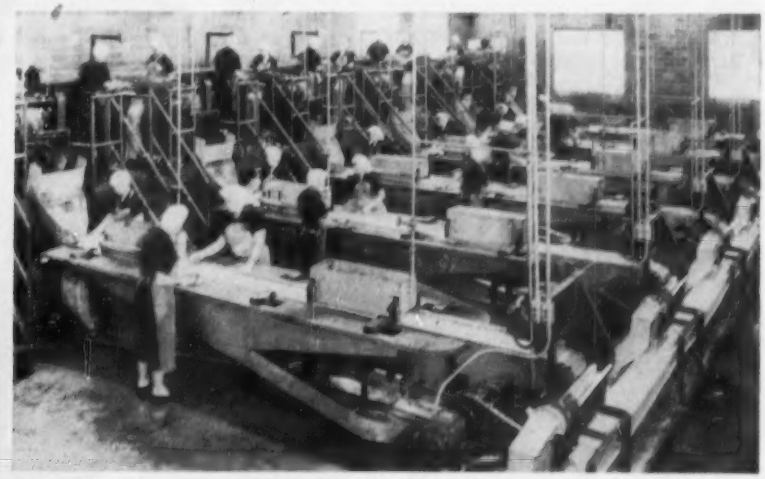
3 **CONVEYOR** flights elevate ears for gravity flow into plant.



5 **CORN** from chute (left) is carried on 24-in. flat belt and fed manually to six huskers (center).

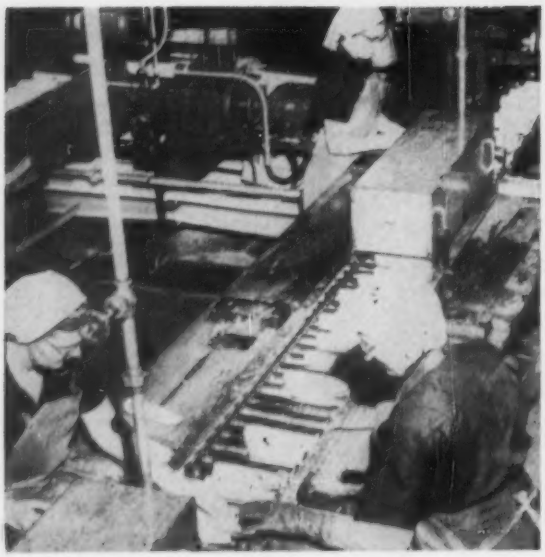


4 **ELEVATOR** discharges into chute (arrow). It is powered by 7½-hp. motor.

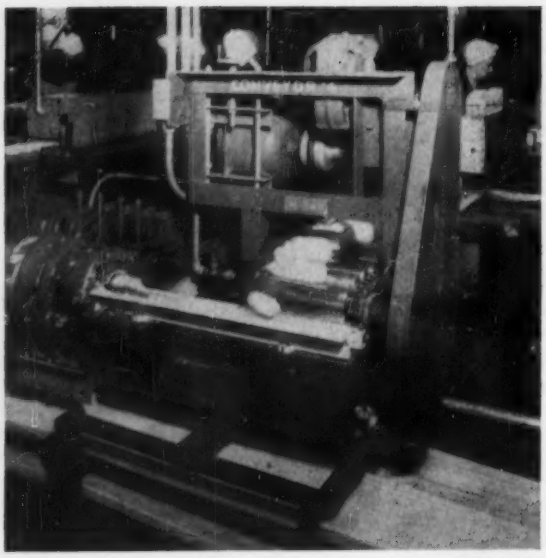


6 **HUSKED** ears are discharged onto 20-ft. roller conveyor on which they are thoroughly spray-washed, then trimmed and inspected.

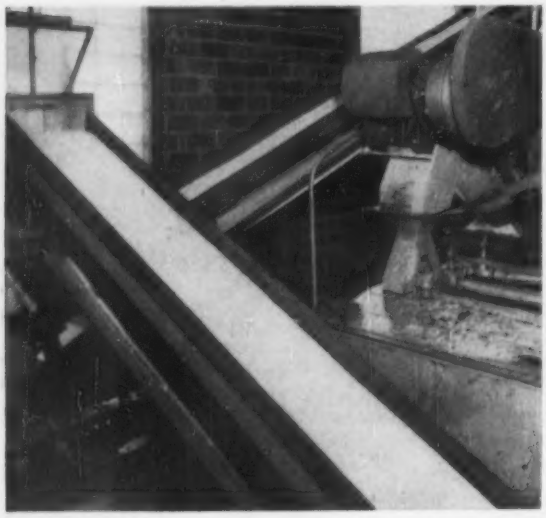
TURN PAGE ⟶



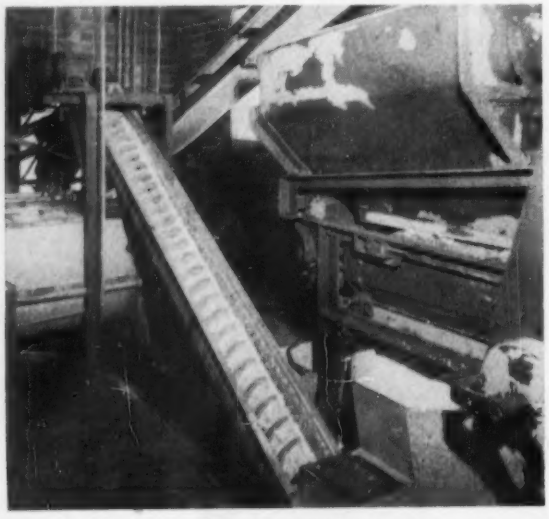
7 **INSPECTION** conveyor, one of six, gently rotates twice-washed ears. Rollers, 10½-in. long, are water-tight.



8 **CUTTER** automatically separates corn from cob, discharging cream corn to one 10-in. belt, cobs to another.

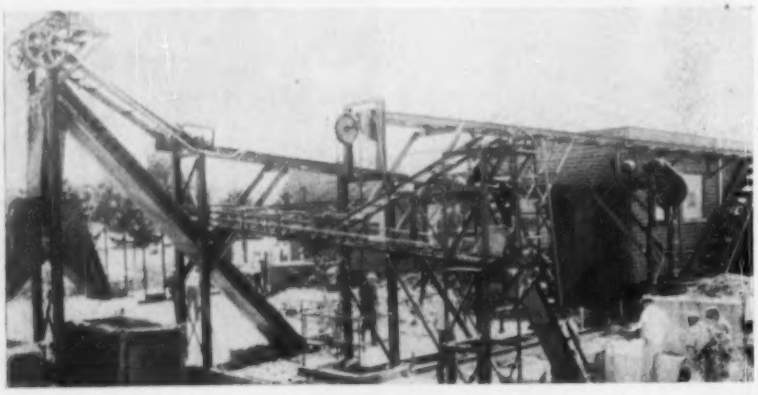


9 **RAISED-EDGE** belt conveyors rapidly transport cream-style corn up inclines from first silker to second.



10 **FROM** second silker cream-style corn is carried up at sharp angle, to batch mixer by 9-in. screw conveyor.

11 **SCREW** conveyor of 12-in. diameter moves cobs to silage belt.



12 **COB** and husks go by flight conveyors to dump. There silage is emptied into horse-drawn carts for journey to farms.

CONTINUOUS, large-scale salad dressing set-up. Starch slurry is prepared in tank (extreme right), heated and cooled in Votator (right), discharged to premixing tanks (left). Here, eggs, oil, vinegar, and spices are incorporated, then mixture is emulsified by pumping through colloid mill (lower left).

Advanced Techniques for Making—

Mayonnaise and Salad Dressing

Variations in processing methods and equipment now permit manufacturers to attain non-stop operation regardless of volume . . . Working tests for raw materials, finished products detailed. Composition largely controlled by FDA standards of identity, but flavors and colors differ

ALFRED J. FINBERG
Consultant in Food Technology, Brooklyn 2, N. Y.

Although mayonnaise and salad dressing made their debute as condiments or diet "extras," they have now come to be hailed as staple foods.

Today, mothers, dieticians, and others concerned with feeding, recognize the intrinsic food value of both products. So these dressings, once very much of a garnish, have gained rightful acceptance as major sources of nutrients.

In the following pages we will spotlight pertinent government specifications for the two products and their constituents, working tests for insuring quality, types of equipment required, formulas, manufacturing procedures, and sanitary factors.

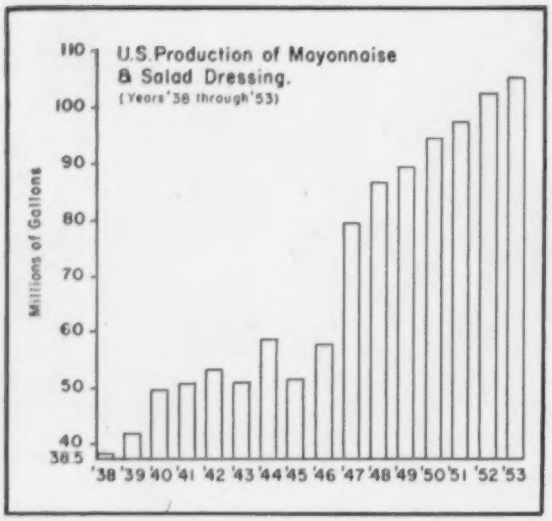
Defining of government standards in 1928 for mayonnaise and salad dressing was instrumental in relieving the early chaos due to adulteration, cheapening of products, and general lack of regulation. Today there is only a narrow range of variability in products, with the major differences occurring in the spice constituents.

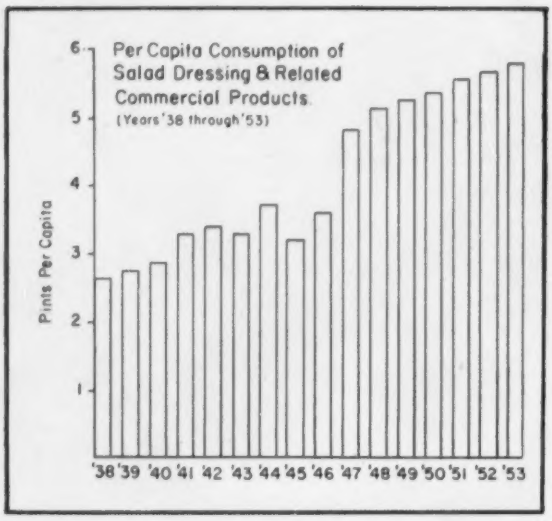
Government Specifications

Standards have been revised from time to time, and those of Nov. 5, 1949 are the most up-to-date. Here, mayonnaise is defined as an emulsified, semi-solid food containing—

1. **Oil:** At least 65% by weight of one or a blend of two or more edible vegetable oils.
2. **Acidifying ingredient:** One or both of the following:

Behind the Great Rise of the Dressings





Phenomenal rise in the sale of food items that make possible quick lunches for school children and working people is readily understandable.

That we are a nation of sandwich and salad eaters is the basis for the great climb in mayonnaise and salad dressing. With the increase in the number of men and women engaged in work away from home comes the upward trend (chart at left, above).

Rising per capita consumption of commercial salad dressings and related products is shown even more clearly by the U. S. Dept. of Commerce (chart on right).

In evaluating these data it is interesting to note how changes in income level have affected the specific choice of either mayonnaise or salad dressing.

Use of the former increases in prosperous times, and that of salad dressing goes up during periods of economic depression and material shortages.

a. Vinegar of not less than 2½% acidity by weight, or vinegar mixed with citric acid, provided the citric acid does not account for more than 25% of the weight of the vinegars calculated as acetic acid.

b. Lemon or lime juice, either frozen, canned, concentrated or dried, diluted with water to an acidity calculated as citric acid of not less than 2½% by weight.

3. **Egg-yolk-containing ingredient:** Liquid or frozen egg yolks; liquid or frozen whole eggs; or either, mixed with liquid or frozen egg whites. No minimum requirement is stated.*

It *may* also contain: Salt, sugar, dextrose, corn syrup, honey, other syrups, mustard; paprika, other spices or spice oils, monosodium glutamate, and any suitable harmless food seasoning or flavoring provided they do not simulate egg yolk color.

And *may* be mixed and packed in an atmosphere in which air is replaced in whole or in part by carbon dioxide or nitrogen.

Declaration of citric acid must be made on label.

Salad Dressing

This product is defined as an emulsified semi-solid food containing—

1. **Oil:** At least 30% by weight of one or a blend of two or more edible vegetable oils.

2. **Acidifying Ingredient:** One or both of the following:

a. Any vinegar or vinegar-water mixture, or vinegar-citric acid mixture, provided the weight of the citric acid is not more than 25% by weight of the acetic acid in the vinegar. Vinegar may be any one or a blend of two or more vinegars such as distilled, wine, cider, sugar, and malt.

b. Lemon or lime juice as in 2-b under mayonnaise.

3. **Starches:** A cooked or partly cooked starch paste prepared with a food starch, tapioca flour, wheat or rye flour or any two or more of these. Water may be used to make the paste.

4. **Egg-yolk-containing ingredient:** One or more of the following in an amount to be equivalent to at least 4% by weight of liquid egg yolks: Liquid or frozen egg yolks, liquid or frozen whole eggs, or any of these mixed with liquid or frozen egg whites.

Salad dressing *may* also contain: Salt, sugar, dextrose, corn syrup, honey, other syrups, mustard, paprika, other spice or spice oils or extracts provided they do not impart or simulate egg-yolk color, monosodium glutamate, and any suitable food seasoning or flavoring other than imitations imparting or simulating egg-yolk color.

Also *permitted* in a quantity not exceeding 0.75% by weight of the finished dressing is any one, or combination of the following emulsifying ingredients: Gum acacia (Arabic), locust bean gum; gum guar, gum karaya, gum tragacanth, Irish moss extract, pectin, propylene glycol ester of alginic acid, sodium carboxymethyl cellulose.

And the dressing may be mixed and packed in an atmosphere in which air is replaced partly or wholly by carbon dioxide or nitrogen.

Label declaration must be made of citric acid, and any optional emulsifying ingredients.

Prohibited Ingredients

The following products *Must Not* be used in salad dressing or mayonnaise: (1) Antioxidants, (2) Tartaric and lactic acids, (3) Ascorbic acid, (4) Mineral oil, (5) Dried egg-yolk products, and (6) Milk, milk-solids, non-fat dry milk solids, or cream.

* Government contracts state a 7% egg yolk minimum.

Olive oil is not prohibited, but is also not recommended because it has been found unsuited for use in the commercial products.

Vegetable Oil Quality Important

Since they are the predominant items in mayonnaise and salad dressing, careful specifications should be set up for the purchase of vegetable oils.

Many oils have been used in the past and are still listed in the Federal Specifications as permissible. However, soybean, cottonseed, and corn oil are the three in most common use today, with soy leading for the past four years, having preempted the places held by cottonseed and corn.

Oils are purchased in tank cars (containing 8,000 gal.), tank trucks, or drums according to the amounts required. Since the oil should be cooled to 45-50 deg. F. before using it is possible for a manufacturer to increase his storage capacity to the equivalent of a tank car, and thereby effect a considerable saving, by installing a large storage tank (6,000 gal.) and two smaller refrigerated tanks of 1,000-1,200 gal. each.

In establishing quality control for the oil it is first necessary to know when it was refined and under what conditions the shipment was made. These factors provide a most important basis for quality since we know a vegetable oil starts to retrogress from the moment it is refined.

Testing the Oil

In the laboratory the first tests are organoleptic—checking flavor and odor. This is done by careful tasting and evaluation. The oil should be bland and neutral in flavor. It may be heated to 212 deg. F. to determine presence of foreign odors.

Once the history of the oil has been established, a series of checks, such as for free fatty acids, peroxide value, Kreis test (rancidity), cold test, and color, can provide standards for control.

The free fatty acids test serves as a qualitative factor. A standard of .05% is considered as a maximum tolerance. As decomposition of the oil proceeds the free fatty acid increases. This does not necessarily mean that it is rancid nor inferior. It merely shows the conditions under which the oil was refined and its condition on delivery. The method specified in the A.O.A.C. is used. It is of vital importance to provide a refined oil which is as fresh as possible in order to obtain maximum shelf life for the finished dressing.

Peroxide Value is determined as follows: Weigh out a 10g. sample of oil into a 500 cc, Erlenmeyer flask. Add 50 cc. of a mixture composed of 30 cc. glacial acetic acid and 20 cc. chloroform. Add 1 cc. of a saturated solution of KI and shake the mixture. Sixty seconds after the addition of the KI add 100 cc. of water. Titrate with .1 N sodium thio-sulfate to obtain millimoles of peroxide/1,000g. of oil.

This test shows the degree of rancidity, and provides a measure of the prospective life of the oil. It shows the influence of air, light and time upon the oil and measures the amount of oxidation due to these factors at any specific time. Zero peroxides are being achieved by careful control and the use of nitrogen in the refinery.

If the refined oils are free of peroxides, use of nitrogen in tank cars excludes air and prevents the ensuing chain reaction with formation of peroxides and rancidity. Further use of nitrogen in the manufacturing process is discussed later.

The Kreis test serves as an index to potential rancidity and is sensitive to one part in four million. It provides a method for evaluating the freshness and purity of an oil.

To perform it: Use a 10 cc. sample of oil and add 10 cc. concentrated HCl. Add 10 cc. 0.1% phloroglucinol in ether (diethyl) and shake for 30 sec. Allow to stand.

Red or pink in lower layer designates rancidity or potential rancidity of the oil.

The Cold test is used to determine condition of an oil at low temperature. If the stearines and sterols have been properly removed there is no crystallization or cloudiness in the oil after 5½ hr. at 32 deg. F., and the mayonnaise or salad dressing made with it will not be affected at lower temperatures.

In this test a 4 oz. sample bottle of oil is sealed tightly and placed under finely cracked ice or at a temperature of 32 deg. F. for 5½ hr. The oil must be clear at the end of this period.

Color of an oil depends on the method and degree of refining. Manufacturers are not as interested in this question as in the past since refining processes have been so greatly improved. It must be borne in mind that a darker oil may provide a dull appearance to a finished dressing, and this must be avoided. The Lovibond tintometer has been used as a basis for standardizing color. Maximum and minimum specifications may be set up on this color scale.

Storage of the Oil

Information from processors on placing oil storage tanks shows that the factors to be considered are: (1) Minimum exposure to air; (2) Ease of cleaning; (3) Pos-

TABLE I—APPROXIMATE COMPOSITION of Various Types of Frozen Eggs (Percent)

	Whole Egg	Egg White	Egg Yolk
Moisture	73.7	87.2	56.7
Protein	13.3	12.0	15.2
Fat	12.3	0.2	27.1
Ash	0.7	0.6	1.0

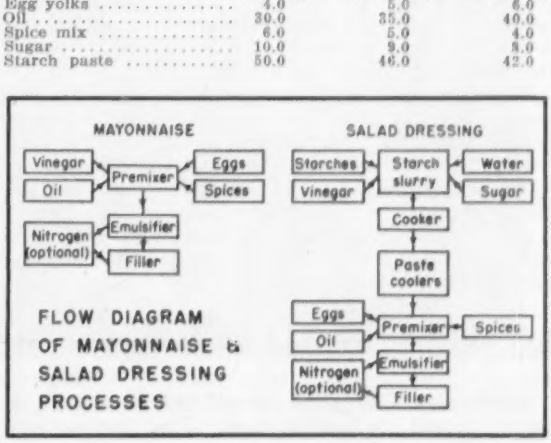
100 parts shelled whole eggs=40 parts yoke+60 parts white.

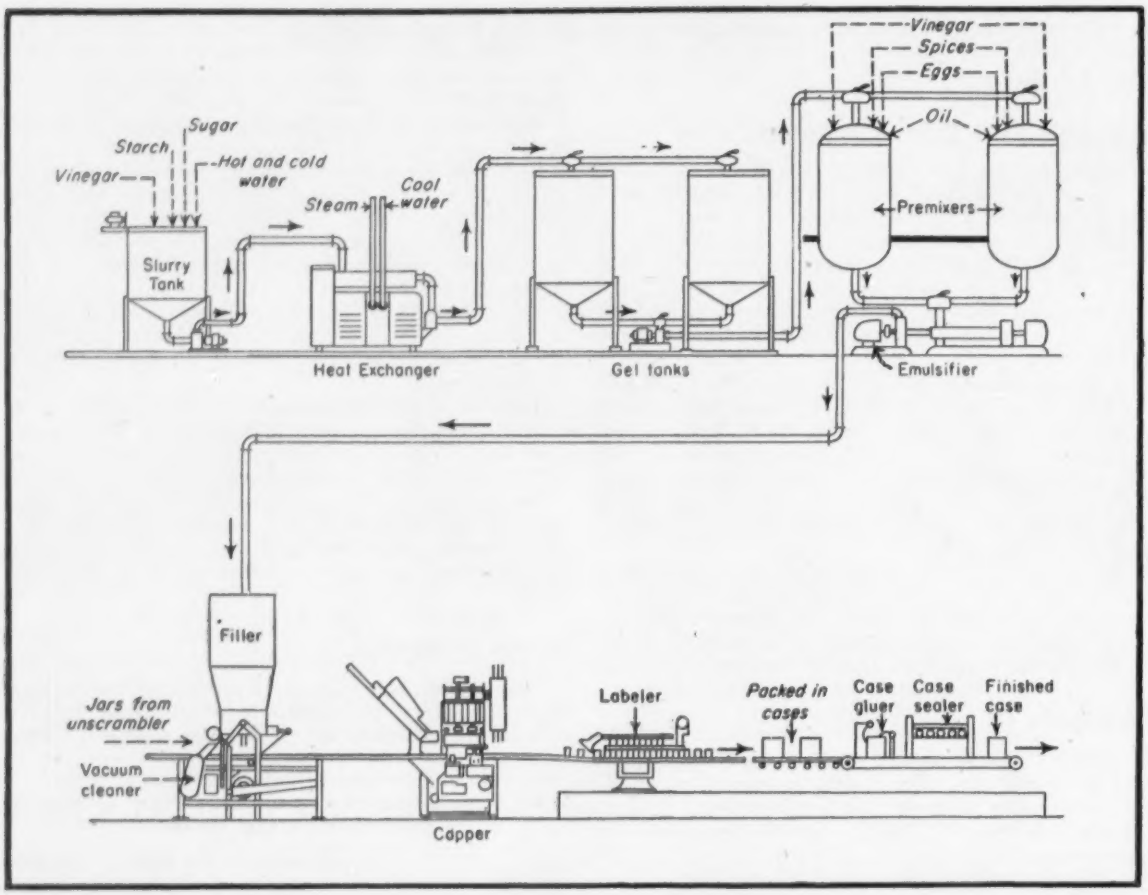
TABLE II—FORMULAS for Different Types of Mayonnaise

	Consistency		
Ingredients	Light (Percent)	Medium (Percent)	Heavy (Percent)
Egg yolks	9.0	8.5	6.3
Oil	77.3	78.8	81.2
Spice mix	3.2	3.2	3.2
Vinegar and water	10.5	9.5	9.3

TABLE III—FORMULAS for Different Salad Dressings

	Types		
Ingredients	Low Oil (Percent)	Medium Oil (Percent)	High Oil (Percent)
Egg yolks	4.0	5.0	6.0
Oil	30.0	35.0	40.0
Spice mix	6.0	5.0	4.0
Sugar	10.0	9.0	8.0
Starch paste	50.0	46.0	42.0





sibility of draining the oil from the tanks, and (4) Locating them in a cool place, preferably the basement.

Recommended tanks are of black iron or glass-lined. They must be kept clean and free from strong, fatty odors. Oxidized surface oils not only impair the delicate flavor of the oil itself but cause deterioration in the flavor of the finished dressing. For this reason tanks should be kept as full as possible, and kept closed so that light and foreign matter are excluded.

Cleaning should be done at least once a month by rubbing the surface oil down to the lowest part of the tank with a squeegee. Once a year they should be cleaned with a 1 deg. Baumé solution of caustic lye and soap (¼ oz. lye plus ½ oz. soap/gal. of water). Washing with the solution is followed by two water rinses and drying with cloths. A film of oxidized oil should never be allowed to form on the inner surface of the tank.

When smaller storage tanks or drums are used, it is best to keep the pipe lines full at all times to prevent formation of a film of oxidized oil in the pipes.

It is extremely important to avoid contamination of oil by dirt; residue, and odor from nearby materials; and development of poor flavor and rancidity from lack of a proper cleaning opening. There must be no copper valves, pipes, or fittings since this metal will hasten the deterioration of the oil.

Egg Yolks, Whites, and Whole Eggs

Specifications for egg yolks should include color, flavor, egg solids, and low bacterial count. Most manufacturers of mayonnaise and salad dressing use egg yolks that have been frozen with specific percentages of sugar or salt. However, a few still use fresh yolks, whole eggs, homogenized yolks and white, or eggs with both sugar and salt added.

For many years the USDA has attempted to set up standards for the egg processors. This is a very difficult problem and the following specifications have been suggested: Grade A frozen yolks–less than 100,000 viable bacteria per g. Grade B frozen yolks–less than 250,000 per g.

The egg people feel that this specification is too inelastic for an entire packing season. With careful control of the entire egg separating operation, however, these standards could be maintained.

A good specification for minimum bacterial count follows:

Bacteria	under 250,000/g.
Coliform	under 1,000/g.
Yeasts	under 100/g.
Molds	under 100/g.

There is a specification for egg solids in these products. The method used for their determination is that set forth in the Official and Tentative Methods of Analysis of the A.O.A.C. (1950 Edition):

"Egg yolks are yolks of eggs of the domestic hen so separated from the whites thereof as to contain not less than 43% total egg solids."

Although eggs may be purchased with a lower percentage of solids, *i.e.* higher percentage of egg whites, this means that a larger amount of egg material is used and the moisture content in the final product must be com-

pensated for to obtain uniformity. (For approximate composition of frozen eggs see Table I.)

Since stability and richness of flavor of mayonnaise or salad dressing, and a large part of the color, depend on egg materials, control of color, egg solids, and bacterial count is essential to the uniformity of the finished product.

Here, as with the purchase of other raw materials, a reputable processor will provide a product to conform to manufacturing specifications.

Manufacturers who use fresh yolks entirely must examine each delivery carefully. These manufacturers are in the minority today since most yolks are purchased in frozen form, in 30 lb. containers, with added sugar or salt (or both) varying from 3-10%.

They are contracted for well in advance on the basis of color and solids required. In many sections a light colored product is preferred (specification for eggs in New York —1.5-2.0 NEPA), whereas in New England a deep colored product (eggs 3.5-4.0 NEPA) is sought. Specific egg breaking plants will yield certain colors.

Color is determined on a rising scale from 1 to 10, with 1 being the light (almost white), and upward gradations indicating increasing yellowness. This scale is a part of the Tentative Approved Method for measuring yolk color which is approved by the National Egg Products Assn., and is almost universally accepted. This scale is important in establishing uniformity since color of yolk in a shell egg varies with the season and territory of production. It is also important to note that early in the breaking season it is easier to produce yolks that are lighter in color.

Average solids content (percent) of frozen eggs that have been generally accepted as standards are: Whole eggs 26.3; egg yolks 43.0; egg whites 12.5.

Thawing Frozen Eggs

When eggs are frozen and stored, many bacteria are destroyed. However, when they are defrosted the surviving ones begin to multiply. Frozen yolks defrost faster than whole eggs and whole eggs defrost faster than egg whites.

Care should be taken in thawing. Quick defrosting by heating cans or placing them in warm water is not advised. The USDA has published recommendations for holding and defrosting frozen eggs that are to be dried, and these are applicable for use by the dressing manufacturer as well.

They are that frozen eggs be held at 40 deg. F. for a maximum of 72 hr., or at 50-75 deg. F. for a maximum of 24 hr. to partially defrost them. Product should then be cooled to 45 deg. F. or less and held at that temperature for not more than 16 hr. before being used.

Low temperature defrosting has been proved to retard bacterial increase. Egg yolks defrosted at 55 deg. F. had a lower bacterial count at the end of 72 hr. than egg yolks defrosted at 68 deg. F. had at the end of 48 hr.

Shaking the can shortens defrosting time since transfer of heat from sides to center of the mass is speeded. This also helps to keep the bacterial count low.

In practice, many manufacturers move egg yolks from 0-10 deg. F. storage and place them in a room at 35-40 deg. F. on the day before production. Here they reach a viscous condition and are used at 45-50 deg. F.

Vinegar, Water, and Flavoring

Cider or distilled white vinegar are generally used in mayonnaise and salad dressing manufacture, the choice being based on flavor desired and cost. However, many manufacturers use combinations of the two types.

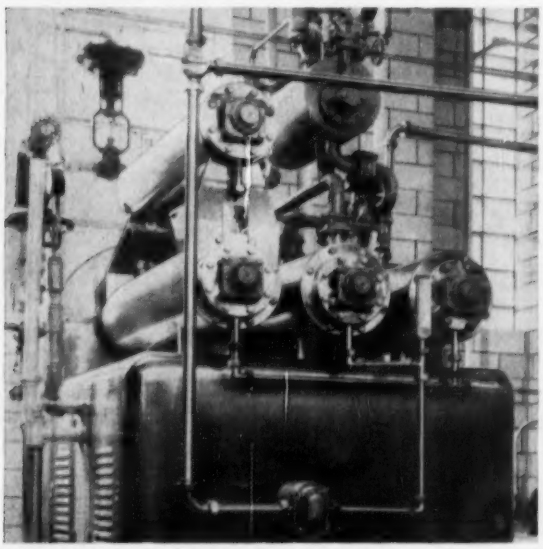
Strength of a vinegar is measured by its acetic acid content or its "grain"—100 gr. vinegar contains 10% acetic acid; 40 gr., 4% acetic acid, etc.

Extreme caution must be taken to ensure uniform mixing of vinegar and water. Lack of proper combination has frequently led to spoilage and fermentation.

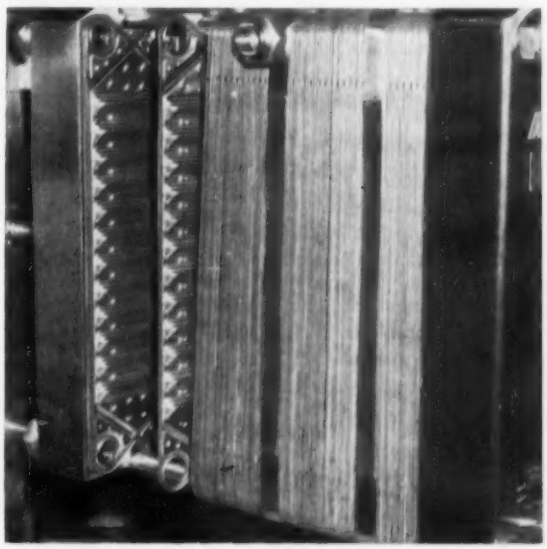
Water, of course, must be suitable for drinking, and should be of medium hardness. If it is alkaline, the alkalinity should be measured and quantity of vinegar in the formula increased to compensate for this.

Salt is used for its stabilizing action as well as for

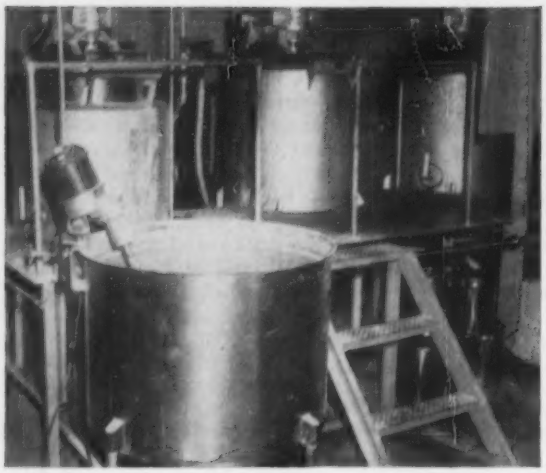
Heat Exchangers Enable Quick Starch Slurry Processing



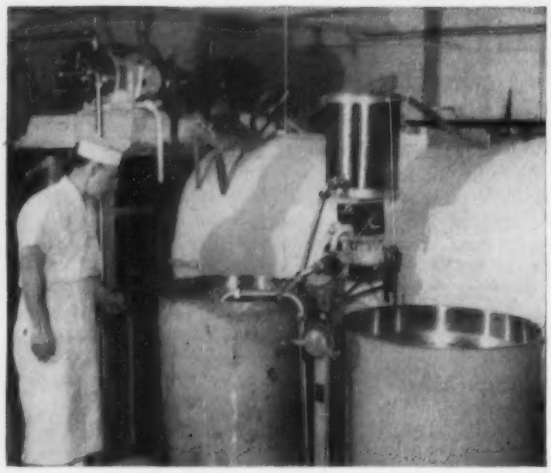
VOTATOR comprises cylinders in which slurry is quickly heated to desired temperature, then cooled to 90 F., discharged to storage tanks. (Girdler Corp.)



IN PLATE UNIT slurry is heated as it flows in thin sheet between plates in first section, cooled by similar flow in second section. (Walker-Wallace, Ltd.)



STARCH slurry is mixed with water and vinegar in 125 gal. stainless tank equipped with Lightnin unit (foreground), then pumped to cooker (directly behind). Two coolers (right) enable continuous operation.



OIL is metered from storage tank (rear), vinegar is measured into turbine type premixers to complete ingredient incorporation. Dressing is then pumped through colloid mill (top left) to filler.

flavor. For this reason it must be free from impurities, and contain no added calcium or magnesium salts, since these accelerate rancidity.

Most formulas call for 1.0-1.5% salt. Fine flake or granulated salt is generally used.

Sugar, either granulated cane, beet or liquid, may be used. Many formulas contain as high as 3½%, but the average is about 2%.

Mustard of two types is generally used: Brown (brassica nigra) or yellow (brassica alba). Occassionally the two are blended.

Quality of seeds and method of manufacture of the dry mustard are important in the flavor and quality of the finished dressing. The dry product must have good clear color, a uniform fine grind, and be free of specks and coarse particles. Usual range in a dressing formula is .25-1.0%.

Some manufacturers prefer to use mustard oil in place of flour. It is combined with the vegetable oil being used to make up a 2-3% stock solution.

Three Types of Emulsifiers

Units employed in the manufacture of mayonnaise and salad dressing may be grouped in the following classes:

1. Vertical type batch mixers (Hobart, Reid).
2. Vertical or pump type emulsifiers (Viscolizer, Case).
3. Colloid mills (Tri-Homo, Charlotte).

Producers of the specific equipment can demonstrate the particular advantages of each and give more detailed information on methods of use and manufacture of the products.

How To Make Mayonnaise

Methods of manufacture vary with type of equipment. When using a vertical type batch mixer, beat egg yolks for 5 min. at high speed. Disperse salt, sugar and other dry ingredients in ¼th of water-vinegar mixture and add to egg yolk with agitation.

Add the oil gradually and, as the emulsion builds up, add the remaining water-vinegar mixture simultaneously, proportioning it so that they are both completed at the same time. This entire mixing should be completed within 12-15 min.

After mixing at low speed for 1 min. the mayonnaise is ready for filling.

Vertical or pump type emulsifier. Combine egg yolks with approximately ¼ of water-vinegar mixture in which all the sugar, salt and spices have been incorporated. While this is being pumped through the equipment the oil is added within 3 to 4 min. During the last 3 to 4 min., remainder of water-vinegar mixture is added.

Final emulsion is pumped through the equipment for about 30 sec. to insure a uniform mixture.

Colloid mill. Make a rough emulsion or premix by placing 5 gal. of finished product (or previous day's premix) in suitable mixing equipment or premix tank. Then add the egg yolks and agitate 2-3 min. until mixture is uniformly dispersed.

Build up the batch by adding spices, making certain that there are no lumps in them. Add oil (usually 80% of a 100 gal. batch) at a rate of about 20 gal. per min. Valve on the vinegar tank is opened to allow a gradual flow. (The vinegar has previously been reduced with water). If the water is added separately this should be done gradually at the same time the vinegar is added to the mixture.

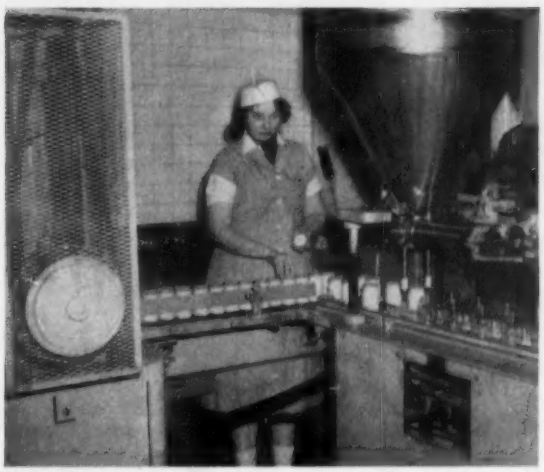
Vinegar-water-oil addition should be timed so that all the oil is added about ½-min. before the vinegar is incorporated in the premix tanks. This is based on the theory that the oil particles are coalesced by the final vinegar addition.

Spatula Test

There are many tests that the operator learns by working on the product itself. However, a good factory test is that made with a flexible stainless steel spatula. When the spatula is dipped in the premix emulsion, mayonnaise clings to the blade but then flows off evenly.

In the actual production of a 100-gal. batch there is no difficulty in uniformity premixing all ingredients within a 10 min. period. With experience this can be reduced further by using two premixers and having the egg material and spice mix in each tank while the oil and vinegar are being incorporated.

Can Be Continuous, Too



FILLING is by twin unit. Jars are removed from carton and placed on parallel conveyors that feed them to filler. Operator starts caps as filled jars move to tightening unit (left).

LABELING is semi-automatic. As jars are conveyed from cap tightener, operator inserts them in labeler, then places labeled ones on table (left) to be hand-cased, sealed and palletized for shipment.

Temperature is an important factor in mayonnaise and salad dressing manufacture, with 45-50 deg. F. being the optimum range for emulsion stability. It is important that the oil be at a controlled temperature of 45-50 when it is incorporated into the emulsion, or even lower if there is no graining effect. There is variation in graining with different types of oils at these lower temperatures as well as a possibility of the oil lines setting up.

Colloid mills are usually equipped with water jackets that can be used to control temperature rise in the product being pumped through them. As stated above, a less stable emulsion is produced if the product becomes overheated.

With a further improvement that consists of addition of a varidrive rotor specifically controlling temperature rise by allowing for a change in rotor speed within a given range, the Tri-Homo is able to provide greater stability of emulsion.

Furthermore, best results are obtained by operating mills as recommended by the manufacturer concerning clearances between rotor and stator, and pump pressures and speeds from premix tanks through the mill.

Formulas that will provide mayonnaise of light, medium and heavy consistency are given in Table II.

Consistency, texture and flavor of a mayonnaise should not be judged until at least 24 hr. after mixing. It requires at least this length of time for the product to develop its proper flavor blend and set.

To provide the best possible product, it should not be moved excessively or shipped for at least 24 hr.

Nitrogen Extends Shelf Life

Since specifications for mayonnaise and salad dressing do not allow use of antioxidants, nitrogen has been found very beneficial for increasing shelf-life of the products.

It is inert, has low solubility in fats and oils, and has no effect on flavor of the products. It can be measured into the mayonnaise or salad dressing as they are pumped to the homogenizer or colloid mill.

Tanks are set up in series and attached to a ¾ in. line. By using a Thorpe tube the amount may be measured in liters/min. and coordinated with flow of product in gal./min.

Further use of nitrogen has been made in filling hoppers and closing machines where headspace of jars is filled with the gas just before capping. This provides added protection, promotes added shelf-life, and prevents flavor deterioration.

Salad Dressing Manufacture

Addition of a starch paste distinguishes salad dressing from mayonnaise.

Originally it was thought of as a cheaper substitute, but over a period of time it has become a distinct product, with its own flavor and texture characteristics.

There no longer exists the prejudice against salad dressing as a substitute product. In fact, as we have seen, the over-all production in the US now exceeds that of mayonnaise.

Salad dressing may vary in oil content from the lower quality products of 30-35% oil to the higher quality dressings of 35-50% oil. When egg and oil are decreased starch paste must be increased, which, in turn, necessitates a change in the acidity and sugar content in order to provide proper stability and flavor balance (see Table III).

With an increase in oil there is a corresponding improvement in flavor, body, texture and stability. This is to be expected since the higher the oil content, the closer it approaches the characteristics of mayonnaise.

Preparing Starch Paste

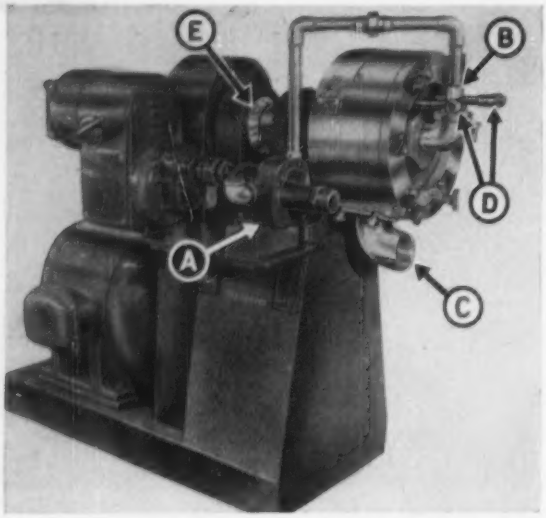
First step in the production of salad dressing is the formation of the starch paste. (Paste refers to the starch preparation to be mixed with the egg and oil components.)

This is one of the most important elements of the entire process. It is frequently a source of trouble for the manufacturer because of the careful control that must be exercised in the cooking, cooling and handling of the paste.

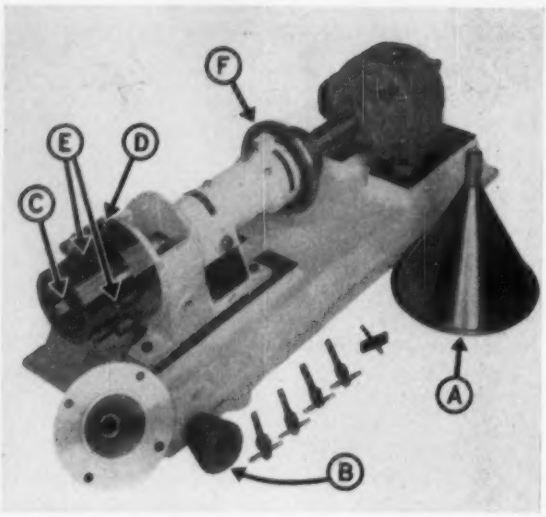
Furthermore, the formula for the starch paste must be carefully balanced so that all of the ingredients are in correct relationship if a successful paste and finished dressing are to result.

Pastes are prepared in many ways with various types

Typical of Units For Emulsifying Dressings

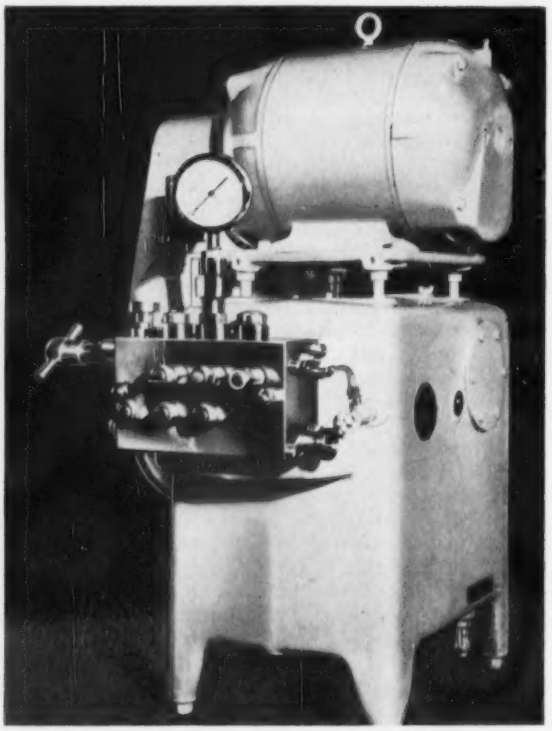


IN Tri-Homo, pump (A) feeds dressing to inlet (B). It is emulsified between rotor and stator, discharged at (C). Cooling water enters and leaves at (D). Rotor-stator clearance, indicated at (E) is adjustable without stopping machine. (Tri-Homo Corp., Salem, Mass.)



IN Charlotte colloid mill, dressing enters through funnel (A), passes between rotor (B) and stator (C), is discharged at (D). Cooling water enters and discharges at (E). Clearance between rotor and stator is adjusted at (F). (Chemicolloid Labs., New York.)

HOBART MIXER has four beater speeds, sanitary, open-rim bowl that fits on 4-caster dolly. (The Hobart Mfg. Co., Troy, Ohio.)



HOMOGENIZER comprises 3-cylinder pump fitted with minute, adjustable orifice through which dressing is forced at high pressure. (Cherry-Burrell Corp., Chicago)

of modified starches and vegetable stabilizers being used. Among recent developments are inclusion of such products as Irish moss to insure maximum viscosity and smoothness while decreasing the starchy flavor.

Some combinations contain vinegar, water, sugar, salt and spices. Others combine a portion of the sugar and add the remainder, plus salt and spices in dry form. Still others use a slurry (dry ingredients combined with water.)

The particular paste depends on the viscosity desired in the final product. Many manufacturers blend their

starches or purchase special blends. All strive to attain the properties in the paste which most nearly approach their finished dressing.

Too much emphasis cannot be placed on the proper cooking of the starch. Undercooking yields a thin unstable product with potential bacterial fermentative organisms present, while overcooking leads to a combination of varying viscosity and instability. These faults can be overcome by following instructions issued by the starch producer.

Continuous Cookers

Many cooking and cooling procedures are used, from batch steam-jacketed kettles and water-jacketed coolers, to open kettles and cooling in cans. More advanced methods of heat exchange, utilizing such systems as the Walker-Wallace plate unit or the Votator provide uniform continuous cooking and cooling of the paste.

Cooking temperature depends on the type of unit, amount of agitation, type of starch, and whether or not sugar and vinegar are combined therein. One constant requirement, regardless of cooking method, is that the paste must be cooled rapidly to 90 deg. F. Smaller packers who have no mechanical facilities cool their paste in pails. This is a very rudimentary method. If used, the pails should be placed in a cooling tank and contents of each stirred until paste reaches 110 F. to prevent thinning. The paste should also be covered with a small amount of oil to prevent surface hardening.

The following points must be stressed:

1. Agitation of the paste through the cooking and cooling cycles to insure rapid heat transfer.
2. Temperature control to provide uniform consistency and proper viscosity.
3. Rapid cooling.

Actual processing of salad dressing is essentially the same as for mayonnaise. The cooled paste is combined with egg yolks while adding the oil. When colloid mills are used finer emulsification is obtained. Here, however, wider clearances are recommended in order not to impair texture and stability of the finished dressing. The general suggestion is wide clearance and rapid emulsification.

Here again, the equipment manufacturer can provide the specific method based on the type of final product desired, even as to altering the size of the oil globules in the dressing by coordination of pump speeds and mill clearances.

Sanitation Essential To Quality

Cooperation among plant personnel is essential in maintaining plant sanitation. The operator of the equipment should be responsible for its cleanliness as well as its performance.

Promptness of cleaning is effort-saving and more economical over a long period. This includes cleaning of utensils, equipment and premises as they are used.

Many types of cleaning materials can be employed and these are well outlined by the manufacturers. It should be remembered that plain water is a detergent in every sense of the word. Its action is improved by increases in temperature but, adjuncts must be added for each specific type of cleaning. These are what are known as "detergents" and "cleaning chemicals".

The cleaning operation involved in mayonnaise and salad dressing requires:

1. Saponifying those fats and oils which are saponifiable.
2. Suspending insoluble particles for easy removal during cleaning.
3. Dissolving of ingredients such as sugar, salt, and spices.
4. Prevention of precipitation of metallic soaps (lime dispersion).
5. Separating soil from adhering surface with wetting agents that will preferentially wet the soil.

A good detergent must perform these jobs and, in addition, must be quickly soluble, non-corrosive and easily rinsed.

In cleaning, warm water is run into each tank to about one-third of its capacity. A trisodium phosphate or metasilicate cleaner is added. Long handled brushes are used to scrub the tanks and then the solution is pumped through the lines to the kettles. Each tank is rinsed clear and then treated with a 200 ppm. solution of sodium hypochlorite or quaternary ammonium compound.

Tank should be thoroughly rinsed immediately following the sodium hypochlorite treatment to prevent corrosion of the stainless steel.

Amount of detergent and disinfectant used should be varied to take care of increase in organic matter. Exact minimum dosages must be computed. These are determined on the basis of individual cases since each manufacturer may use different operating procedures, processing equipment, pumps, materials handling, and filling.

Bacterial Contamination

Remnants of organic matter and seeding of bacteria, yeast and molds in any part of the line or equipment can result in sporadic fermentation, contamination and spoilage. This indicates how important it is that regular checks and microbiological counts be taken of any potential trouble spots.

Of equal importance is daily dissembling of sanitary pumps and fittings during cleaning, and allowing them to dry thoroughly overnight before assembling again. Each pipe and fitting should be brushed individually and rinsed clean.

Some microorganisms show a tendency to build up resistance to disinfectants and for this reason a judicial alternation of disinfecting procedures is indicated.

Although the foregoing material has been outlined as a guide to those engaged in the production of mayonnaise and salad dressing there are important lessons to be learned. Constant heed must be given to these factors:

1. Adherence to specifications
2. Quality control of raw materials
3. Using equipment carefully in relation to the formulas
4. Proper continuing plant sanitation

If this is done the best possible dressings will be produced and the ultimate gain is increased volume of sales and consumer acceptance.

Bibliography

Analysis of Standards of Identity. Bulletin 263, Mayonnaise & Salad Dressing Manufacturers' Assn. Aug. 23, 1950.

Bulletins 380-W, 381-W, 396-W, 379-W, 344-W. Procter & Gamble Co., Cincinnati.

Finberg, Alfred J. "Mayonnaise and Salad Dressing Manufacture, Procedure and Equipment." *Chemicolloid Laboratories Pamphlet,* New York, 1952.

Hoffman, Edward *Cleaning Compounds.* Sanitation Lines No. 2, National Confectioners' Assn., Chicago.

Salad Dressing, Mayonnaise and Related Products. U. S. Dept. of Commerce, Washington, D. C., 1953.

Steel, Anna M. *Salad Dressing, Mayonnaise and Related Products.* U. S. Dept. of Commerce, Washington, D. C., 1949.

Minimum Requirements for Facilities, Operating Procedure and Sanitation in Official Plants Processing and Packaging Egg Products. USDA, Production & Marketing Adm., 1948.

Winter, Alden R., and Wrinkle, Carolyn. "Proper Defrosting Methods Keep Bacterial Counts Low In Frozen Egg Products." *The US Egg & Poultry Magazine,* Mar. 1949, Chicago.

Joffe, M. H. *Mayonnaise and Salad Dressing Products.* The Emulsol Corp., Chicago, 1942.

Bulletin No. 54, National Egg Product Assn., May 10, 1950.

Heeding These Basic Installation Steps

1 EXCESS water is brushed from base slab, following its thorough cleaning, wetting down, and saturation overnight.

2 GROUT coat of pure cement is vigorously worked into slab.

Farsighted Test of Flooring *Pays Big Dividends*

New England candy manufacturer continues to reap savings from 5-yr. test program in early 20's. Concrete floors put down in 1927 still in daily use

C. J. LARKINS
New England District Manager, Kalman Floor Co., Boston

Heavy-duty concrete floors at W. F. Schrafft & Sons Corp., Boston, are 28 years *old and still going strong!*

Thus this candy maker has saved thousands of dollars which, with less rugged flooring, would have been disbursed for resurfacing, patching, and costly maintenance.

Story of this major saving goes back to the early 1920's when astute plant engineers decided to focus extra attention in determining the type of flooring best suited for the candy-making operations. Upshot was a careful 5-year flooring test prior to making a final decision.

The engineers recognized that the floors would be subject to severe demands. In addition to normal trucking and materials handling, there was erosion from sugars, chocolate, and coconut oil contributing materially to floor deterioration. Also, a candy plant could not afford to have floor "dust" ever-threatening to contaminate the products.

With these factors in mind, six different types of concrete floor were selected for an evaluation test. All were put down in a 5,000 sq. ft. area in an existing Schrafft building. Over the next few years, each section was subjected equally to all the demands of the candy-making operation.

In a short time, results became apparent. But it wasn't until about five years later that the over-all report was in and the findings fully evaluated. All but one of the floors showed early signs of deterioration—wearing away, pitting, cracking and softening, which hampered flow of materials and interfered with production processes. Dusting, too, was noted in excess of levels dangerous to products.

The test section that stood up to the demands was a heavy-duty absorption process floor. It showed no signs of weakening, softening, or disintegration during the test period and actually "polished" under constant usage. It lent itself to easy maintenance, and its smooth surface expedited operations.

Main points responsible for success of this floor, laid by our organization, Kalman Floor Co., were: (1) Materials used; (2) technique of installation, and (3) absorption-process method of controlling water-cement ratio.

Used was a type of Portland cement formulated for maximum bonding characteristics, chemical resistance to disintegration, and minimum shrinkage.

Aggregate consisted of fine and coarse hard rock of basaltic or granitic origin. This type of rock, formed millions of years ago by volcanic action, has a dense, fine-grained, interlocking crystalline structure ideally suited for floors. No other type is ever used by our company, which will transport it as much as a thousand miles if it is not available near a job.

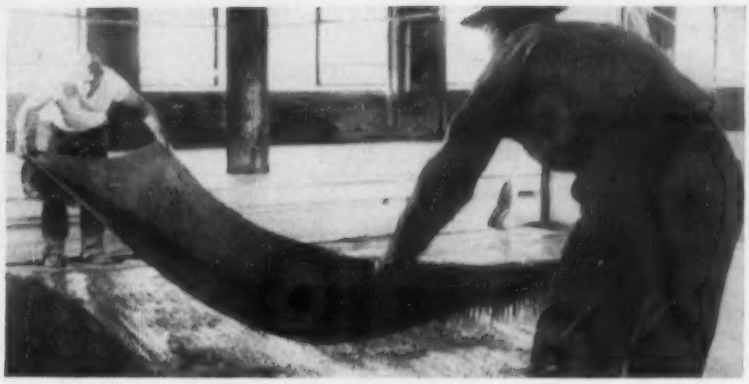
Controlling Water Content

As for installation, the base slab was mechanically wire-brushed to remove the scum. The slab had to be completely clean, otherwise a firm bond with the topping could not be achieved. Next the slab was wetted down and kept saturated overnight.

Just before start of operations the next day, excess water was broomed off and a grout coat of pure cement vigorously worked in. This coat also aids in achieving a firm bond. The

Will Assure Longer-Lasting Plant Floors

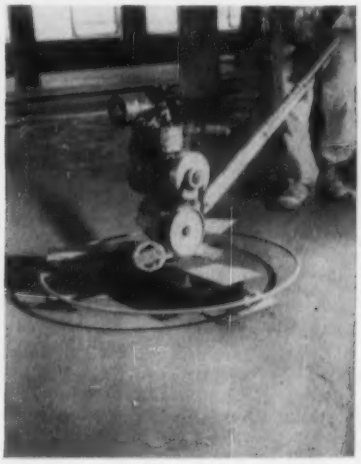
3 **MIX** is placed and screeded level ¾ in. above the base.



4 **ABSORPTION** blanket is then placed over screeded mix and covered with a drying agent that sucks up the excess water.

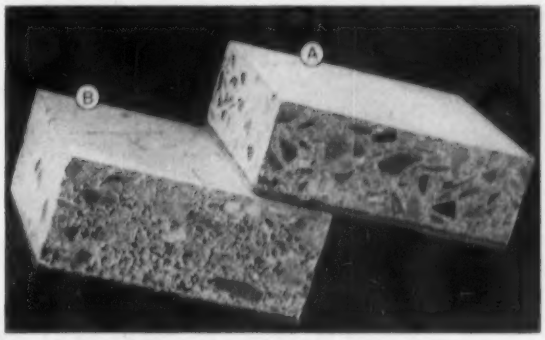
5 **IN** 10 to 30 min. (depending on atmosphere) blanket is removed.

6 **POWER** floating, first step in finishing, compacts topping.



7 **MECHANICAL** troweling further densifies the concrete.

8 **SKILLED,** experienced hand troweling is the finishing step of the operation, resulting in . . .



9 . . . **DENSE** concrete (A) with even distribution of aggregate. Compare with lose type (B).

mix was then placed and screeded to a level ¾ in. above the base slab.

An absorbing blanket was then placed over the wet mix and covered with a drying agent which sucks up the excess water. This densifies and pre-shrinks the mass, helps to prevent voids and, through capillary action, achieves the tight bond so necessary to long floor life.

The absorption process also permits early starting of finishing operations—within 10 to 30 min. after screeding, depending on temperature and atmospheric conditions. This means that the first finishing operation, floating, can begin before the delicate crystallization of the cement is reached.

Power floats compacted the mass further. Then came mechanical troweling. The machines moved over the surface many times. Hand troweling was the final finishing step. Here the skill and experience of our people paid off. Hand trowelers were on the job far into the evening until the superintendent judged the floor finished. Temperature and atmospheric conditions were vital factors influencing this decision.

Finally, there was the absorption-process itself. Initially, sufficient water was added to the mix to assure easy workability of the mass and complete hydration of the cement particles. Excess water was taken out with the absorption blankets and the drying agent.

If this water had been allowed to remain, the "fines" in the aggregate would have risen to the top and the coarser hard rock aggregate would have sunk to the bottom. Result would have been a weaker floor with a shorter life. Goal is to have the coarse rock, which is really the wearing element, at the top as well as evenly distributed throughout the mass.

If the mix had been placed with a low-water content originally, the cement would not have completely hydrated and its binding qualities would have been severely inhibited. In addition, it would have set more rapidly with a higher percentage of voids.

Our company, having pioneered the absorption-process, overcomes the principal objections to too much or too little water by using enough, then withdrawing the excess after it has performed its function.

The dense topping, without voids or weak spots, prevented sugar acids, chocolate, or oils from penetrating. Its smoothness facilitated materials handling, promoted safety, and kept candy particles from accumulating. If the floors had set-marks or even slight

(Turn to page 158)

● ● ●

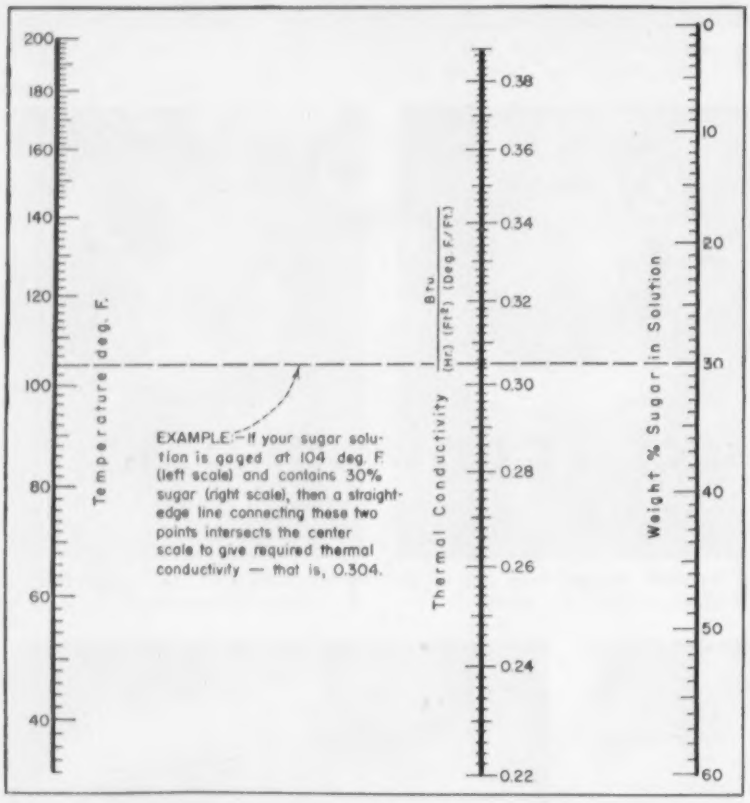


Chart Quickly Tells Thermal Conductivity

—of aqueous sugar solutions in wide temperature-concentration range . . . Accurate to ± 5 percent

O. P. KHARBANDA
Research Dept., Simon-Carves Ltd., Stockport, England

In heat transfer calculations involving aqueous sugar solutions, usual practice is to assume an average value for the thermal conductivity—for this property varies with temperature and concentration.

But with this handy nomograph you need no longer assume. A quick line along a straight-edge accurately spots this factor in the concentration range 0-60%, and for temperatures from 32 to 200 deg. F.

And the chart may be used for both glucose and sucrose solutions.

Suppose you want to find the thermal conductivity of a 30% sugar solution at 104 deg. F. (see chart). All you need do is spot 104 on the left scale, 30 on the right scale—and then with a ruled line joining these two points you read thermal conductivity as 0.304 on the center scale.

As calculated from a table of careful experimental data,* this value is 0.303 —indicating the very high accuracy of this nomograph.

Although such conductivity data are available, they are tabulated at only 10-deg.-F. intervals. Hence, interpolation is necessary for intermediate values. And such interpolation—particularly with respect to temperature—is time consuming, because thermal conductivity of liquids is not a simple-linear function.

Data Correlated

Problem is somewhat simplified by the following equation, which resulted from a recent critical analysis** of all available data. Its experimental error is less than ±5%.

$$K = (306 + 0.643T - 0.001T^2) \times (1 - 0.0054W)10^{-2}$$

where K is thermal conductivity Btu./(hr.)(ft.²)(deg. F./ft.); T is temperature deg. F.; and W is weight percent sugar in solution.

Converting to metric units with thermal conductivity in terms of kg.-cal./(hr.) (meter²) (deg. C./meter), and temperature in deg. C., the equation reads:

$$K = (486 + 1.55T - 0.005T^2) \times (1 - 0.0054W)10^{-2}$$

But solving these equations is laborious, especially when the accompanying nomograph provides a simple direct solution to our first equation.

---

* L. Riedel, *Chem. Ing. Tech.* 21, 340, 1949.
** B. C. Sakiadis and J. Coates, "A Literature Survey of the Thermal Conductivity of Liquids," Louisiana State University, Engr. Exp. Sta., Bull. No. 34, 1952.

PHOENIX, Ariz., spreads sanitation know-how through seminars. Here group discusses recent bakery session at which author (right) made inspiring contribution. Others in group (left to right) are: J. O. Slaybaugh, Diversey Corp.; Dorothy Craig and James A. Dolce, Phoenix Public Health Dept.; Louis A. King, Jr., American Institute of Baking; Wendell Reeder, Campbell Taggart; and Paul Maier, U. S. Public Health Service.

How to Select Your Sanitarian

And What He Must Do

Sharp pointers on bakery sanitation which apply to other food plants. They include tips on picking the man for job and on doing job right

WILLIAM H. ZIEMKE
Chief Chemist, Fairfax Bread Co., San Francisco

Great progress has been made in the sanitary standards of the baking field. We have departed from the old idea that a food plant must be kept clean because the law requires that we do so. Bakers recognize that it pays to keep a plant clean.

To maintain a sanitary condition, a well organized and effective sanitary program must be established. This requires that management be familiar with the basic principles of sanitation. And it must have sufficient interest to provide adequate personnel for doing the job.

To carry it out you must have a trained sanitation crew that is familiar with proper use of cleaning equipment and materials. A recognition of the role of competent supervision and a full appreciation of the need for it are without a doubt the most important factors in a good program.

► **Effectiveness of a sanitation department is only as strong as the individual in charge of the program and the degree of authority given to him.**

Your bakery sanitarian must be responsible only to management. Further, he must have leadership qualities.

In addition, he must possess some technical knowledge of cleaning materials and know the functional properties of the ingredients in the various insecticides and fumigants. He must know the problems of production operations, equipment design, and building construction. He should be able to recognize the common insects that infest the bakery.

Must be Administrator

The sanitarian must plan and supervise the application of the following schedules:

1. **Inspection of plant.**
2. **Cleaning of plant.**
3. **Proper spraying of plant for insect control.**
4. **Fumigation of specific equipment for insect control.**
5. **Establishment of a rodent control program.**

You probably cannot find a man within your organization already having all the above qualifications or familiar with the above functions. But you can, in all probability, find a man on your payroll that can *be taught* the know-how of each and all of these.

In many parts of the country short courses are offered

in the practice of sanitation. Your sanitarian should be permitted to take advantage of these.

Also, the field of sanitation includes a group of highly trained consultants available for a nominal fee to serve you in your training program and to give you the outsiders' point of view.

Generally speaking, however, my remarks on the bakery sanitarian are confined to the baker's own in-plant sanitarian.

In selecting this sanitarian, it is best not to take a production worker who has been working on the processing line for a number of years. Such a man has been accustomed to the present way of doing things and all too frequently resists changes.

Must Direct Others

A bakery sanitarian must be able to train sanitors to do an efficient, effective job in properly cleaning every piece of equipment and every department. He cannot possibly do all the work himself. Consequently, he must encourage those under his supervision to take pride in maintaining a sanitary plant.

His function is to establish the proper level of cleanliness and constantly to *follow up* to determine that the job is done right and the schedules maintained.

In this regard it is very helpful to organize a sanitation committee, consisting of the sanitarian, the general manager, superintendent, and chief engineer—and possibly rotating foremen. This group would plan the plant's program. Especially, it would be responsible for the establishment of better cooperation among personnel in maintaining a sanitary plant.

To do an effective cleaning job, the individual sanitor must be supplied with the proper cleaning supplies and equipment. He must know what to use and why. Employment of improper detergents may result in a terrific waste of time. And excessive use of insecticide will result in a waste of money.

Let us now turn briefly to some of the overall in-plant functions of your sanitarian and sanitors—keeping in mind at all times that insanitary conditions are hidden. A few of the direct sources of contamination of bakery products will be considered.

With reference to insects, the principal offenders are the confused flour beetles, silver fish, roaches, flies, Indian meal moths, and Mediterranean flour moths.

Practical Pointers

To control these properly, all ingredients and materials brought into the bakery must be inspected. In this respect, the ingredients we are most concerned with is flour.

Every car of flour must be inspected before it is unloaded. If insects are found on the outside of the bags, the infestation without a doubt was picked up in transit, the flour having been loaded in an improperly cleaned car.

Such a car must be fumigated with methyl bromide, the bags thoroughly brushed and reloaded into a clean car.

Next step is sifting the contents of a number of bags. Use either a 30-mesh wire screen or a 9-XX silk, which will retain the adult insects or larvae. If any insects are found inside the bags, the flour is to be rejected. It is not fit for human consumption.

Flour must be stored on skids 10 in. above the floor, if possible, in a clean, well-ventilated storage area. Sufficient space should be allowed around the stacks for ventilation and application of insecticides.

Only an orderly storage room can be kept clean. Every bag or box containing supplies should be classified and be accessible for regular inspection and be used in the order of receipt.

Use of compressed air to clean such places as cracks in storage areas and many other parts of a bakery is definitely objectionable. The cracks must be sealed so no possible source of insect food is available. The movement of dust and flour from one spot to another by either blowing or brushing is very poor practice. Only a vacuum cleaner is to be used for removing dust.

All noticeable dust and dirt must be removed from the outside of bags before the flour skid is hauled to the dump bin.

The next area that needs regular cleaning is the flour handling equipment. This is a direct source of contamination for bakery products.

Flour that is conveyed through infested equipment will carry along with it insects and insect fragments and excreta.

Cleaning Handling Units

Flour handling equipment must be absolutely cleaned of all flour, preferably every two weeks. A vacuum cleaner must be used to remove the flour.

Cleaning the units should begin with the flour dump bin and continue on through the various pieces of equipment, including the flour hoppers over the mixers. All housing of flour-handling equipment must have enough openings to provide complete access, so that flour may be entirely removed.

After the handling units are completely cleaned of flour, the outside crevices and corners throughout the equipment should be sprayed with insecticide. And the interior of the handling system ought to be thoroughly fumigated with a mixture of ethylene dichloride and carbon tetrachloride.

There are many other possible sources of direct contamination, but these can be more easily corrected. In particular there are ingredient containers and dusting boxes where starch is not used—such as those found to the rounder, overhead proofer, and molder.

Follow a Schedule

None of these can be overlooked, and a regular schedule of cleaning should be maintained at all times. A plant schedule should be established so that the cleaning is done by area, with priority to jobs needing most attention first. A frequency chart must be followed. Good housekeeping rules must be maintained.

Accumulations of dust on floors, in equipment, on walls, pipeline, etc., are conductive to insect infestation. Equipment coming in contact with the product should be cleaned daily immediately following the shutdown.

From the mixing room on through the dough room, makeup department, proof boxes, bread coolers, wrapping and shipping department, good housekeeping must be practiced by your sanitation department.

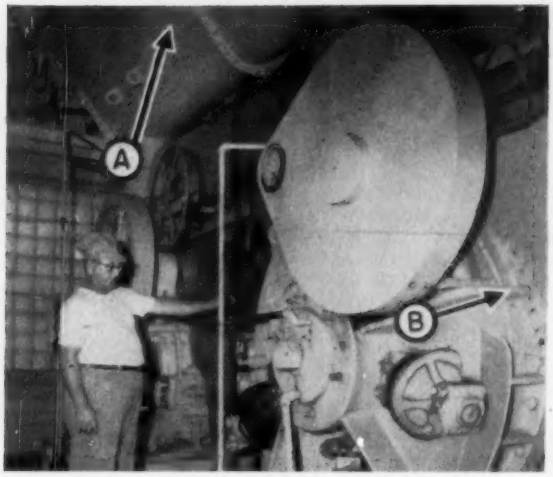
All dirt, dust, and damp areas must be eliminated if possible. And wherever possible all cracks or crevices must be sealed.

Your sanitarian must be aware that the shipping department can be a serious source of infestation. Returnable shipping boxes must be cleaned outside the shipping department. Too frequently they are returned containing garbage, roaches, and rodents.

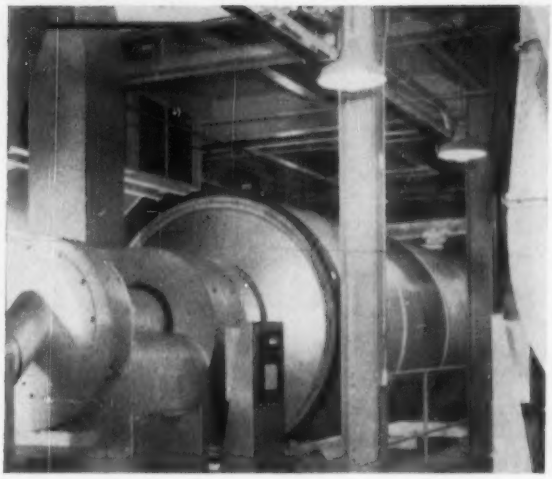
To control rodents is to keep them out. Your sanitarian must periodically inspect foundation walls and windows for any possible openings that will permit the entrance of rodents. Windows that are to be opened must have tight fitting screens. The engineering department has the responsibility of making the building rodent-proof, keeping screens in proper repair and tight fitting.

It is generally agreed that thorough cleaning of a bakery

(*Turn to page 207*)

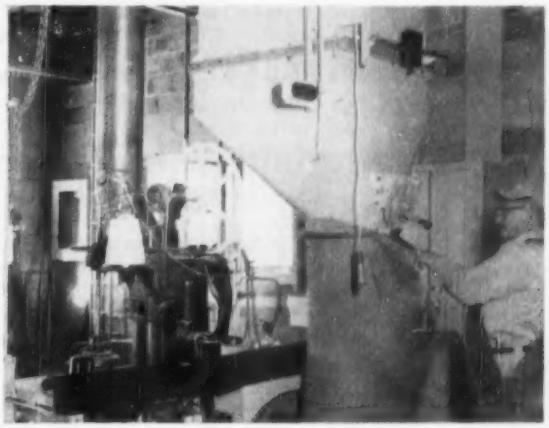


FROM storage bin (A), spent grains drop into screw presses (B) that extract about 20% of water.



LEAVING presses, spent grains are charged into this 2-ton-per-hr. continuous, rotary dryer.

EFFICIENT drying to an 8%-moisture content is checked by this automatic temperature recorder.



DRIED spent grains are scaled into 100-lb. sacks. Also, some of material is bulk-shipped.

Wet Spent Grains *Dried Non-Stop*

System permits brewer easier, faster, more sanitary handling . . . Two units dry 4 tons hourly

FE STAFF

Outstanding performance marks the continuous straightline, quality-drying of wet spent grains from lauter tubs at the plant of Theo. Hamm Brewing Co., St. Paul, Minn.

At present, spent grain is continuously dried to an 8%-moisture content by two 2-ton-per-hr. rotary dryers. This method permits storage of bagged dried spent grains or bulk shipments in 25-ton capacity box cars. Handlings are easy, clean, speedy.

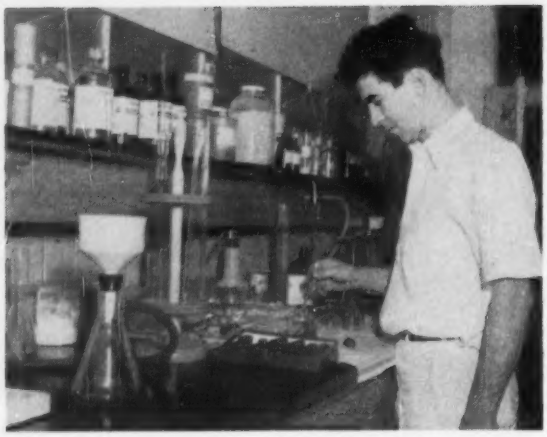
Formerly, wet spent grain was pumped from lauter tubs and into a 200-bbl. capacity storage tank. From here, it was chuted into trucks (sometimes 10 or 12) lined up in the yard, and subsequently delivered for use as animal feed.

In operation, the wet material (about 90% moisture) is now transferred from the brewhouse's four 450 bbl.-capacity lauter tubs into an 18-in.-dia. wormscrew conveyor that carries it to the nearby, modern grain-drying house. It is then fed into a V-bottom iron tank that holds 5,300 bbl.

From here, spent grain is gravity-fed into three continuous screw presses. Entering the press through a top opening, the grain then drops between two large rotating disks, the faces of which come progressively closer together as they approach the discharge or lower end. Pressure exerted by disks extracts water (about 20%) from the grains. Water passes through 18-gage, half-hard brass

(*Turn to page 205*)

CAREFUL checks at Melville Confections make certain incoming raw materials meet specifications.



FURTHER checks on finished goods make sure they are good now and will remain so later.

Winning *Sure* Control of Quality

★ In Materials ★ In Processes ★ And in Finished Goods

Laboratory techniques spearhead strong candy-field trend that puts new stress on uniformity, dependability, optimum products . . . Guide to equipment and what it costs . . . Types of tests and their benefits

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

Marked more in today's confectionery field is an overall quality-control trend seen bringing manifold benefits—to the raw-material supplier, candy maker, retailer, and consumer.

To large confectioners, of course, control techniques are not new. But of the smaller firms making up over 80% of the candy makers, few have facilities—laboratory, inspection, and statistical quality control—to check incoming raw materials, standardize formulas, and direct the manufacture of more uniform quality products.

There's no question that candy manufacturers are now receiving better quality raws. But by working in closer cooperation with suppliers, more laboratory-equipped smaller firms will help in the continual improvement in the quality of these materials. Also, they'll be able to control the quality of these ingredients on the basis of mutually-agreed-upon specifications.

And the day may come when sufficiently high standards may be set for the purchase of such products as nuts and fruits to reduce or even eliminate the confectioners' cleaning and sorting costs.

Receiving uniform quality raws is primary in the benefits attainable through inspection and a control laboratory. These facilities will also enable a small confectioner to check candy quality during key processing steps so as to turn out better and more uniform finished goods. Too, sanitation and housekeeping practices will improve.

But equally significant, the outcome will be greater retailer and consumer confidence in and acceptance of consistently uniform quality candies.

Take, for example, chocolate covered cherries. The consumer will be pleased to find he can depend upon each piece containing a large whole cherry, smooth-flowing cream, and a thick quality-chocolate coating.

What's more, there's nothing to prevent a confectioner, with a new lab set up and well-organized control program, from improving or upgrading his present standards by developing new and better formulas and processing techniques.

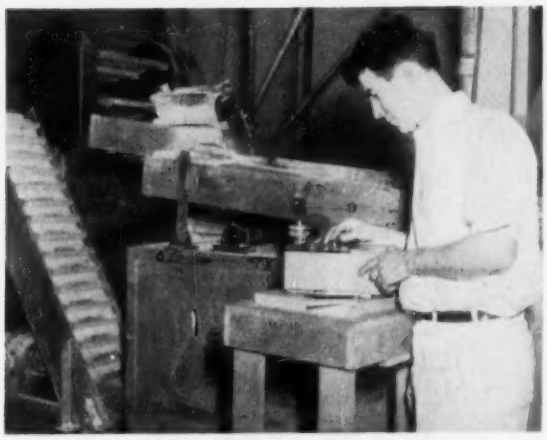
Quality-control boosters are those volume buyers, who are shaping specifications for their purchases. Also specially to be cited are two cooperating associations—the National Confectioners' Assn. and the Scientific Apparatus Makers.

How It Started

The NCA has been sponsoring research with the aim of improving candy quality, and it is considering further cooperation with its members. Also, USDA's Southern Regional Research Laboratories has been investigating use of new ingredients to produce better and longer shelf-life candies. And the Georgia Experiment Station has been studying the effect of different storage conditions on candies containing various ingredients and packed in a variety of wrapping materials.

Then, on the point of volume buyers, Sears, Roebuck & Co. is notable. *It has recently served notice that within three years it will only purchase from candy makers who conduct scientific quality-control programs.*

Sears' drafting of standards was stimulated by the consumer view-



CONSTANT control of amount of moisture in the casting starch is one of the in-process controls.

ANOTHER is the use of a hand refractometer to test solids content of syrup in panning department.

point. These standards make regional buying practical and, to some extent, permit this firm to sharply define quality differences to its sales personnel and customers.

Soon after establishing its quality control, Sears spotted the weakness: Absence of such a program in most of the smaller candy factories. Because this problem was so important in the establishment of a candy-merchandising program, this company's candy division spark plug, Robert W. Watson, sponsored a meeting with 34 key suppliers early in 1953. Purpose, of course, was to stimulate adoption of quality-control techniques in the candy field.

A follow-up meeting was held in Chicago last May for 30 Midwest manufacturers, and a similar one was conducted a few months later for 30 Eastern suppliers. Other meetings are planned this spring on the West Coast, as well as in the South and Southwest.

A typical reaction to the meetings is illustrated by Thompson's Candy House, Seattle. President George H. Thompson returned to Seattle and immediately went into action setting up a quality-control laboratory patterned in great part after a model cited by Sears.

Expenditure to complete this laboratory ran to about $5,000. Equipment comprised a viscosimeter, pH meter, vacuum oven, precision balance, Kjeldahl apparatus, microscope, water bath and, of course, a full complement of standard reagents and accessories.

Some of Sears' tentative quality standards, set up at the Chicago conference, were adopted. At present, laboratory control is confined to raw materials and processing. Already improved have been such operations as stabilizing colors and flavors, maintaining constant moisture levels in confections, and controlling the quality of ingredients going into its product.

We may especially cite here another firm—Melville Confections, Inc., Melrose Park, Ill.—which recently set up a q.c. lab. Measuring 15x24 ft., it, too, cost about $5,000. Of this amount, some $3,500 was allotted to basic instruments and apparatus and the remainder to lab furniture.

Equipment, here, comprises a vacuum oven, colorimeter, polarimeter, refractometer (hand refractometer used in plant), Kjeldahl apparatus, muffler furnace, temperature and humidity cabinet (company built from a $10 used refrigerator), and water demineralizer (used for preparing color solutions).

A control program has laid the basis for improving candy quality and also for research and development. There is expected to be a $5,000 savings in the preparation of more uniform color solutions. And soon, this task will be assigned to an assistant.

The new chemist has already made significant contributions to manufacturing operations by keeping abreast with candy-field developments. And he soon plans to make a number of contributions of his own.

Specifications have further been set up for purchase of raw materials, products in the stage of being manufactured, and finished candies. Significant studies are presently underway on the behavior of products under various conditions. And there are current plans to completely mechanize costly operations.

Specific outcome of the Sears-sponsored meetings were recommendations for three types of controls—use of a laboratory, statistical quality methods, and inspection reports.

Plans were suggested for the layout of a control laboratory for the small candy plant, along with figures on approximate cost of equipment, apparatus, and reagents. Recommendations were made on salary, selection, and training of a chemist.

Emphasized was the initial influence the chemist and laboratory might have in a plant. Only by psychologically preparing plant personnel and correct timing of this change will the lab get off to a good start. Once personnel is convinced of the advantages, then results will quickly and steadily be assured.

True, some of the old timers who take pride in their craftsmanship may look with disfavor upon installation of a laboratory. However, such resentment can be easily overcome by pointing out to them that the lab will not interfere with or lessen their skills—rather it will help them to consistently produce candies they'll be proud of.

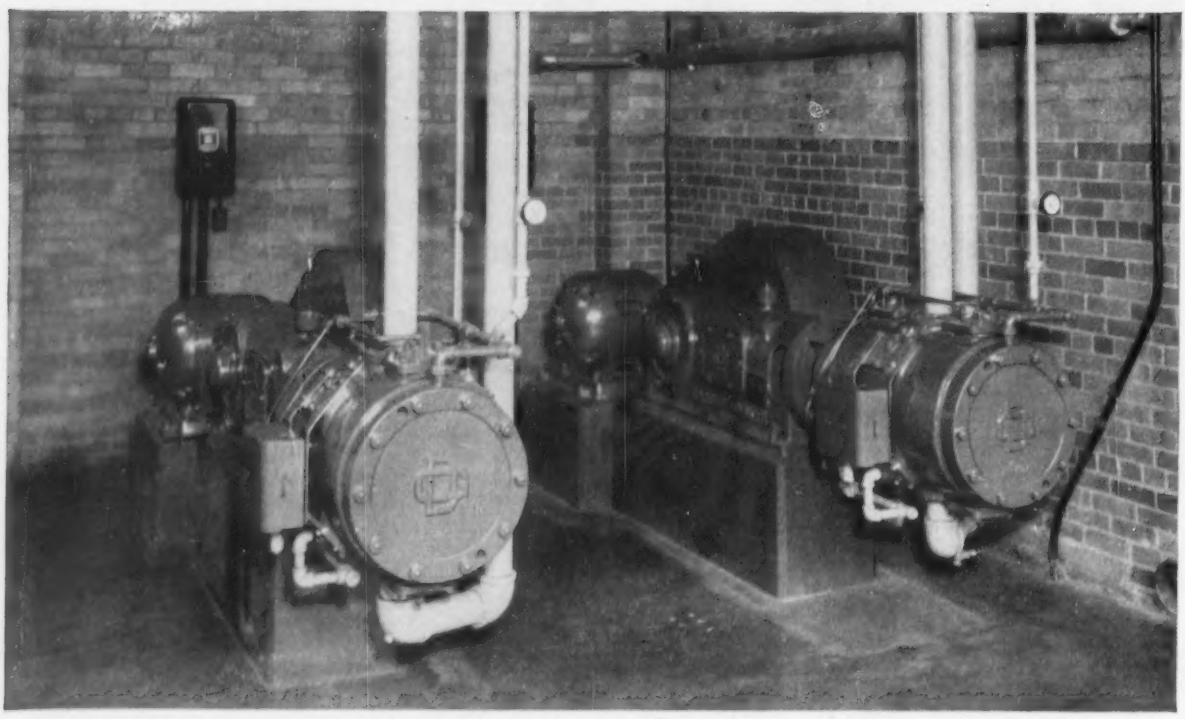
Where a complete laboratory is impractical, certain basic equipment is advised—like a microscope—for examining raw materials. As a supplement, statistical quality control techniques are also suggested to maintain quality uniformity during key unit operations and in finished goods.

Statistical methods will provide the candy manufacturer with maximum information about operations—from receiving to shipping rooms—with minimum effort.

In many cases, troubles can be predicted and, consequently, averted, regardless of whether machines or processes are involved. These methods will also serve as a check on suppliers of raw materials and the quality of finished goods. Moreover, statistical methods steer a manufacturer in the direction of making improvements. And they will provide a means of certifying product quality and, thereby, eliminate inspection duplication by manufacturer and retail buyer.

But in the very small plants, where a laboratory or statistical control system are impractical, inspection re-

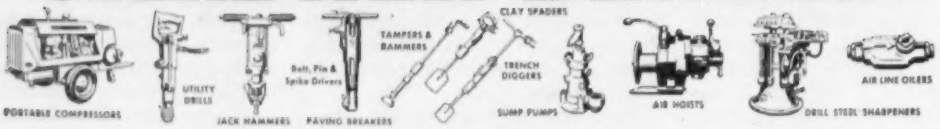
NO OIL
IN THIS AIR!



It's a CRX Carbon Piston Compressor with the famous Gardner-Denver construction that STOPS product contamination. There's no oil in the cylinder—no oil in the air. Send for Bulletin CRC-10.

SINCE 1859

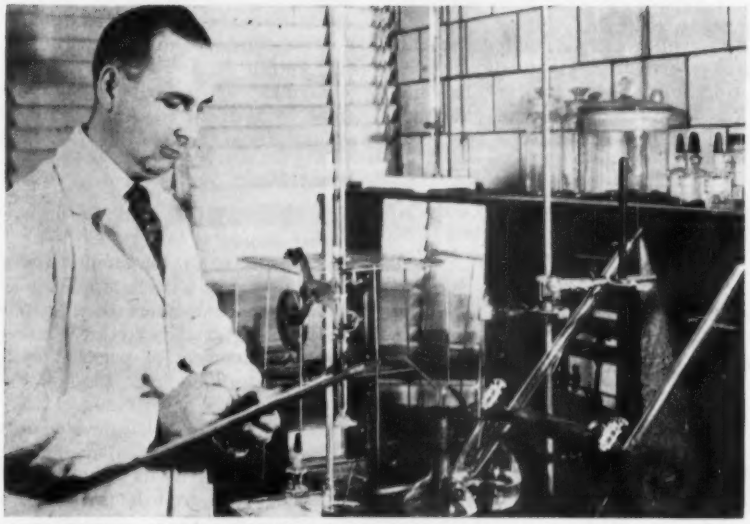
GARDNER-DENVER



THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario



AT SEARS, quality and quantity of candy ingredients are carefully determined by chemical and physical tests to assure tight control.

ports should be used. Psychologically, the effect of such reports is excellent in maintaining consistent effort.

The above-mentioned instances of Thompson's and Melville have thrown some light on the question of cost involved in setting up a quality control laboratory.

This kind of facility can be set up by a minor firm for less than $5,000 —assuming a small amount of space is available. This money is based on an initial expenditure of about $3,500 for basic testing instruments and apparatus (as noted at Melville), with the remaining $1,500 for other laboratory equipment, such as benches, hoods for carrying off noxious fumes, cabinets, and furniture.

Experience with establishing laboratories has shown that overhead, in terms of laboratory materials, replaceable glassware, chemical reagents, etc., will average from $700 to $1,200 yearly for each technologist.

Major investment will be in personnel. Starting monthly salary of college graduates with degrees in various branches of the sciences is $350-$370 per month (July, 1954 figures.) Certainly, a chemist with five years' practice in his field should make a greater contribution than a recent graduate. Monthly compensation ranging to $550 and higher bears this out.

COMPARATIVE ANALYSIS OF 5 LB. ASSORTED CHOCOLATE PACKAGES

	TASTE SATISFACTION	QUALITY AND QUANTITY OF INGREDIENTS	APPEARANCE	CANDY MAKING KNOW-HOW	LABORATORY CONTROLLED QUALITY
SUBSTANDARD (Not sold by Sears)	Taste panel rating— 19 pts. (4th choice) Illus.: Nougat is a hard cream.	Include: Sugar, corn syrup, skimmed condensed milk, resinous glaze. Only 22-24% low-cost dark and light sweet chocolate coating. Creams contain 50% sugar, 50% corn syrup.	Appearance Preference Rating — 36 points. (4th choice). A molded decoration used in center to give appearance of more chocolate than is actually present. 6 varieties. Packaged in a folding-type box.	Only minimum experience and equipment required.	No inspection system or laboratory in plant.
GOOD (Sears minimum standards)	Taste panel rating — 41 pts. (3rd choice) Illus.: Nougat is properly made with egg whites.	Include: Sugar, corn syrup, whole milk. Over 27% good quality milk and dark chocolate coating. Creams contain 70% sugar, 30% corn syrup.	Appearance Preference Rating — 96 points. (3rd choice). Machine decorated to improve appearance. This operation requires additional chocolate. 9 varieties. Packaged in a folding-type box.	Experienced candy makers in operating starch casting equipment and chocolate enrobers. Rapid mass production.	Adequate inspection of raw materials and finished goods. Laboratory facilities satisfactory.
BETTER	Taste panel rating — 58 pts. (2nd choice) Illus.: Nougat made with egg whites, has added fruits.	Include: Sugar, corn syrup, cocoanut butter, whole milk, nut meats. Larger percentage of whole milk used in caramels. Over 33% better quality milk and dark chocolate coatings. Creams contain 80% sugar, 20% corn syrup.	Appearance Preference Rating — 110 points (2nd choice). Machine or hand decorated. 15 varieties. Packaged in a set-up box.	Hand rolled and starch cast merchandise processed by experienced candy makers. Mass production.	Adequate inspection of raw materials and finished goods. Laboratory facilities satisfactory.
BEST	Taste panel rating — 92 pts. (1st choice) Illus.: Egg white nougat made with nuts and pure honey for added taste appeal.	Include: Sugar, corn, syrup, fruit, 40% whipping cream, dairy butter, nut meats. Over 38% high grade milk and dark vanilla chocolate coatings. Most creams made with 100% sugar.	Appearance Preference Rating — 120 points (1st choice). Hand decorated or completely hand dipped to give an appetizing home-style appearance. 23 varieties. Packaged in a set-up box!	Ultimate in candy making experience. Large hand dipping operation. Slow, thorough, careful production methods.	More complete inspection of raw materials, work in progress, and finished goods. Completely equipped candy laboratory.

AND OF CHOCOLATE-COVERED BRIDGE MIX

SUBSTANDARD (Not sold by Sears)	Taste panel rating — 36 pts. (3rd choice)	45% creams, 20% raisins, 20% peanuts, 15% jellies. 35% panned light sweet and dark sweet chocolate coating.	Appearance Preference Rating — 47 points (3rd choice). Poor gloss, marred finishes.	Only limited equipment and semi-experienced personnel required.	No laboratory facilities.
GOOD (Sears minimum standards)	Taste panel rating — 64 pts. (2nd choice)	30% creams, 5% raisins, 12.5% peanuts, 12.5% almonds, filberts, brazils, 10% jellies, 10% crunches, 10% malted milk balls, 10% caramels. Over 45% panned milk and dark chocolate coating.	Appearance Preference Rating — 105 points (2nd choice). Good gloss, free of surface defects.	Fully experienced candy makers with varied knowledge of candy types. Mass production.	Adequate inspection and laboratory facilities.
BETTER	Taste panel rating — 92 pts. (1st choice)	No creams, 25% almonds, 20% walnuts, 10% filberts, 25% raisins, 20% Virginia Peanuts. Over 60 % panned milk chocolate coating.	Appearance Preference Rating — 118 points (1st choice). Pebbled finish gives distinctive appearance.	Specially trained experienced candy makers. Smaller batches with extra attention given to details.	Adequate inspection and laboratory facilities.
BEST	(Not yet developed, since the potential sales volume appears to be small at the present time.)				

Services rendered by a laboratory are difficult to measure cost-wise. However, some plants have been able to arrive at percentage figures.

One, for instance, increased production about 20% after setting up specifications and checking raw materials—and there was considerably less scrap. Another estimated a 25-35% increase in output by laboratory-made formula improvements. Still another was able to reduce the cost of prepared flavors—without reducing their strength—about two-thirds. And yet another, by simply letting the laboratory measure colors and flavors, chalked up savings ranging from 10 to 25%.

Candy manufacturers have followed the pattern set by American industry—adopting mass-production techniques to produce more uniform quality items, reduce costs, and broaden distribution. Also significant has been the use of more efficient equipment and new ingredients.

But in the drive to lower costs, such changes did not often result in a better, taste-satisfying piece of candy. Of course, there were exceptions—some confectioners continued to put out goods of quality value, especially through use of expensive, taste-satisfying ingredients and skilled workmanship.

Low price has been so emphasized that it has tended to become the prime measure of value in the minds of many. Solution may lie in establishment of quality standards that permit the consumer to purchase at specific known quality levels. And here, leadership by large manufacturers could bring about cooperation among all in the field.

THIS $5,000 laboratory at Thompson's Candy House pays solid dividends in control of candy quality.

What Made Sears Act

Sears decided it had to develop quality standards because of—

► **Perishable nature of candies; necessity of setting up a quick supply service through regional—rather than centralized—buying; and need for elimination of differences of personal opinion about various grade candies.**

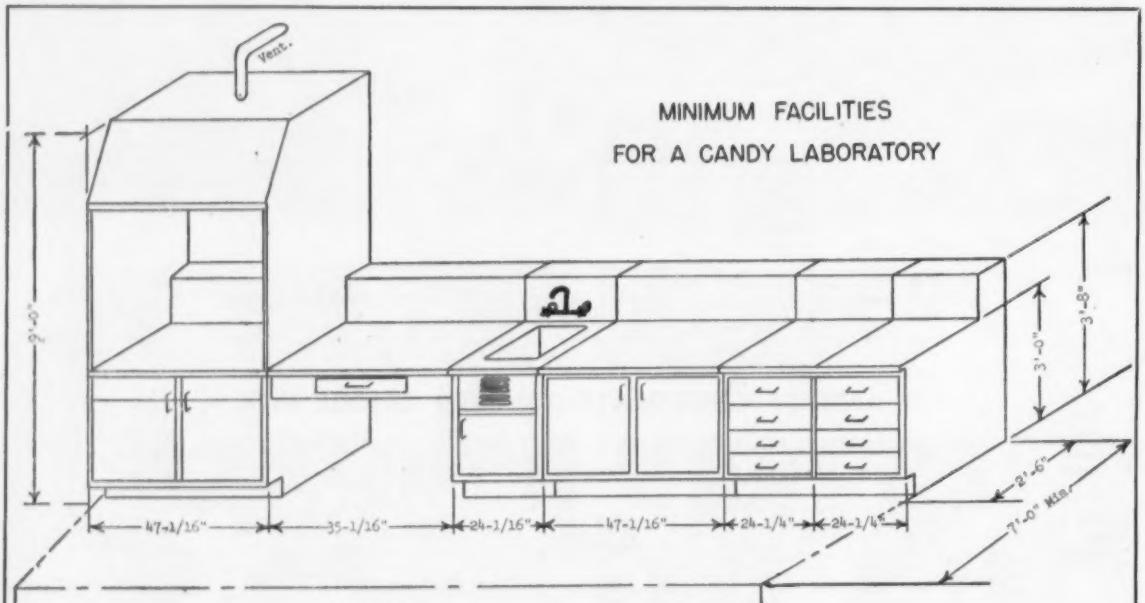
Outcome was organization of Sears' candy laboratory, which devoted over 3 yr. to establishing standards for confections sold in its stores and to protect consumers from buying substandard goods.

Here, competitive merchandise was analyzed for percentage of ingredients, then confections were grouped into certain ranges in which they can be rated on a quality basis. Aiding in this standardizing was a taste panel.

Today, this large buyer evaluates quality of finished candies on the basis of:

1. *Taste satisfaction,* judged by an impartial panel that gives a comparative preference rating to each item.
2. *Quantity and quality of proper ingredients,* determined by chemical and physical tests.

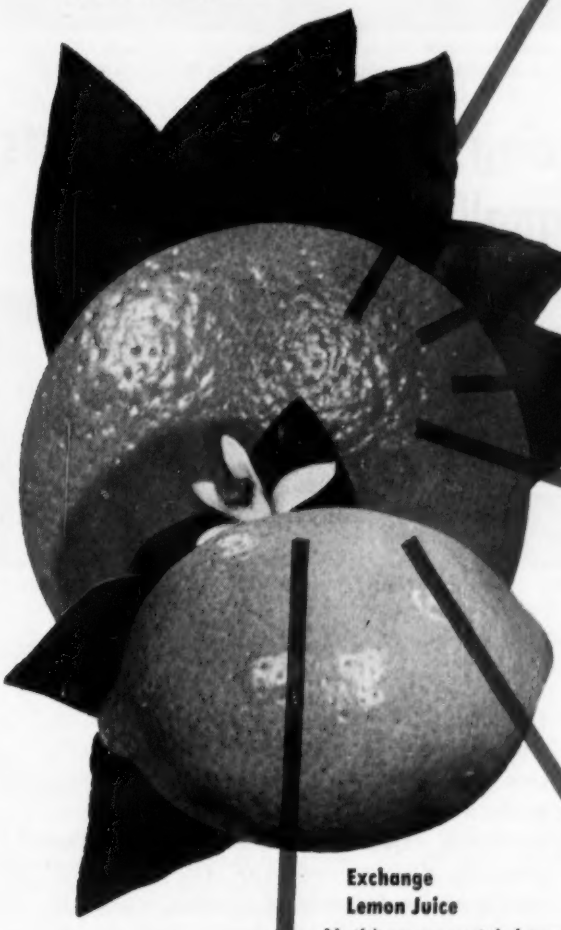
As for quantity, percentage of chocolte coating is determined by dis-



HERE'S a simple "working" drawing of a low-cost laboratory for a small candy factory. Area outlined by dash-lines indicates minimum desirable space. Units need not be in a straight line but may be on opposite sides of an aisle in square or other feasible arrangement. Facilities require access to gas, 115v. a.c. electric line (15 amp.), cold running water, waste line, and vent to outside. Hot running water is desirable but not essential.

Look to Sunkist
for progressive research in food processing

Yes, in every field of food processing, the Sunkist Growers laboratories are making ever-widening contributions to the increased quality of food products. Here are some typical Exchange Brand product developments.



Exchange Oil of Orange

Always consistent, always outstanding in flavor, strength and aroma. An essence you can rely on. Made from fruit grown in the famous Sunkist groves of California.

Exchange Oil of Lemon

The 4-to-1 favorite over all other lemon oils combined! The reason is the superior flavor that comes only from California-grown lemons processed by exacting Sunkist standards.

Exchange Preserver's Pectin

Here is *even* jell strength that gives you consistent, complete reliability in setting control.

Exchange Low Methoxyl Pectin

A natural fruit pectin that jells without sugar. Completely tasteless, permitting the use of the most delicate flavors. Pies made with Exchange Low Methoxyl Pectin won't "run" or "weep" when cut—and you have never tasted such natural juicy fruit flavor. Famous too for aspics, jellied fruit or vegetable salads, dietetic preserves or non-sugar jells.

Exchange Lemon Juice

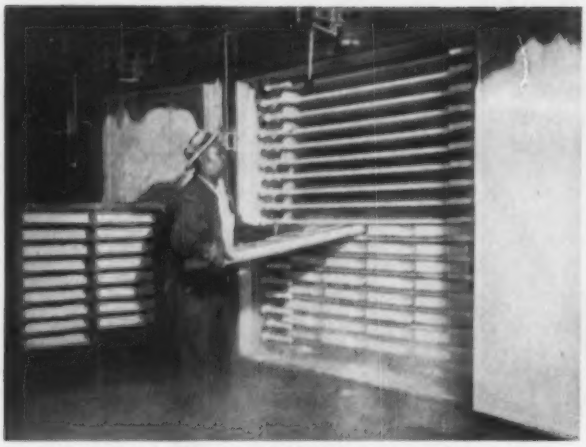
Nothing can match lemon juice for bringing out the natural flavor of *any* food product. It's a superior acidulant in the preparation of mayonnaise, fruit cocktail, figs, fruit nectar, prunes and other heavy-syrup products. Highly effective as an anti-oxidant in processing frozen foods. Citric acid molecules have also been established as effective in the retarding of mold growth. Available in concentrated or single strength form.

Sunkist Growers

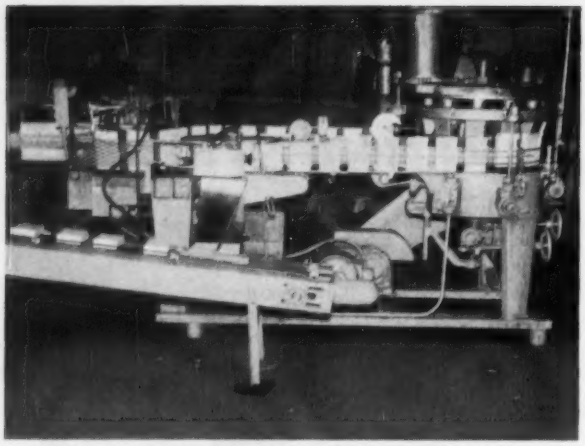
Exchange ®

PRODUCTS DEPARTMENT • ONTARIO, CALIFORNIA
400 West Madison Street, Chicago 6, Illinois
99 Hudson Street, New York 13, N. Y.
318 Commerce Street, Dallas 2, Texas

For more information, use coupon on last page.



The Articold Package Freezer is extremely compact and efficient, freezes faster than blast tunnels at greatly reduced cost.



FMC Mara-Pak Carton Filler—automatic filler for free-flowing granular products in end-opening cartons. Fills up to 250 cartons per minute.

Famous *fmc* filling and freezing equipment cuts costs, speeds output of premium quality frozen foods

Uniform fast-freezing (up to 300 cpm) captures natural fresh flavors in the FMC Continuous Round Shell Can Freezer.

FMC — M&S Plunger Fillers set new standards for high speed, high accuracy filling and product versatility.

There are high speed, fully automatic FMC fillers for filling consumer and institutional size top-opening cartons.

These and other highly specialized FMC machines have literally shaped the profit-building production methods of leading frozen food plants everywhere. This FMC equipment includes several basic models of high capacity fillers for all types of containers; can freezers to meet the ever-increasing popular demand for a variety of frozen canned foods; package freezers for quick, even freezing at extremely low cost.

Continuous, automatic operation of FMC Carton Fillers is maintained at a peak level of efficiency...keyed to present day demands for highest productive food handling methods with reduced manpower requirements. These amazing fillers exemplify modern practices of *Automation* with their precision functions of opening, filling and closing cartons uniformly and at high speeds. When *you* plan, you can't plan better than with FMC...your "Key to Frozen Food Equipment."

Write for full information, or call your nearest FMC representative

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Division

General Sales Offices:

WESTERN: SAN JOSE, CALIFORNIA **EASTERN:** HOOPESTON, ILLINOIS

persing it in ether, weighing the center, and then calculating by difference. Percent coating is now 26 or less for substandard, 27 for good, 33 for better, and 38 for best grades.

Quality is evaluated by color, flavor, and smoothness—and amount of milk solids in the case of milk chocolate. Color and flavor are influenced by grade of cocoa beans and care exercised in blending and roasting.

Eating quality is affected by amount of sugar, and fat and the particle fineness of the coating.

3. *Appearance* is most important in judging a ready-to-sell candy. Appetizing appearance is assured through use of fresh, wholesome ingredients, as well as efficient processing and inspection methods that are designed to produce candies uniform in gloss, color, shape, decorations, and size. Evaluation here is by a professional taste panel.

4. *Candy-making know-how* is reflected in taste, appearance, and shelf-life. It is attributed to efficient equipment and techniques, capable management, and foresight.

5. *Laboratory control* that assures a check over candies being manufactured. It involves gaging adherence to specifications of incoming ingredients, products in-process, and finished goods.

Using these five evaluations, the laboratory now groups candies in these categories:

Substandard—Unacceptable goods not meeting minimum taste appeal, appearance, shelf-life, or ingredient quality and quantity requirements.

Good quality—Candy meeting minimum standards.

Better quality—Good quality merchandise that is sufficiently improved so its "plus" features can be easily recognized by the consumer.

Best quality—Candy to which standards as high as practical have been set.

To show how these quality standards work, take, for example, the 5-lb. box of assorted chocolates distributed during Christmas. The good quality box contained an assortment offering eight different centers, machine-dipped and strung. And pieces were coated with a 27% milk chocolate.

In the better quality box was an assortment of 15 centers, machine-dipped and hand-strung. Pieces were coated with 33% of a better quality milk and dark chocolate.

Then there were 21 different centers in the best quality box. Pieces were machine-dipped and hand-strung, with 38% of fine quality milk or dark vanilla chocolate.

Suggested Control Tests

Logical starting point in a plant's quality-control program is to draw up raw material standards and specifications, which a purchasing department can then submit to suppliers. And these specs should be better than Government requirements.

Once a raw material inspection program has been set up, ingredients will then be purchased only from reputable suppliers. These latter will not resent regular and systematic inspecting of ingredients. On the contrary, they will work closer with the candy manufac-

(*Turn to page 208*)

• • •

New Casing for Food Can Be Eaten

Developed from seaweed, it first will be used for pork sausage. Application to other products foreseen

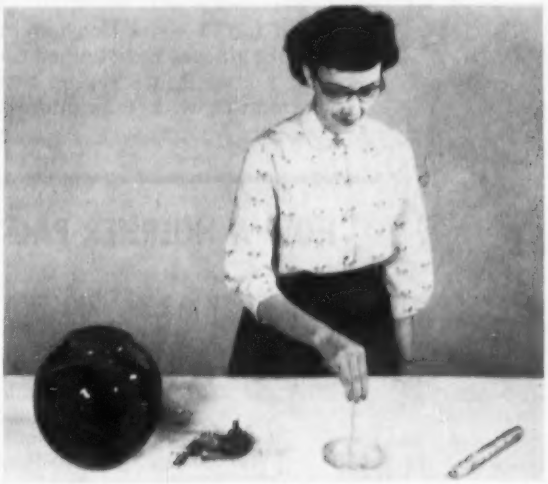
Edible sausage casing of vegetable origin has been successfully developed in this country.

Casings of this type have been produced in Europe. But this one is reported to be the first with such desirable commercial properties as eye appeal, strength, tenderness, palatability, and size uniformity.

Tentatively called, Tasti-Jax, this economical casing is made by Visking Corp. from sodium alginate–a purified, edible seaweed extractive. Extruded into a seamless tubing of uniform diameter and thickness, the alginate is in the form of an insoluble calcium salt. A humectant is introduced to soften the casing.

Expected first use will be for pork sausage links, now formed by stuffing the meat into natural sheep casing. Being investigated is the use of the casing for other meat products where natural casings are traditionally employed. Such items are those dried sausage products like salami and thuringer. Work also is underway to use this casing for frankfurters.

Since the new casing is shirred, task of shirring natural sheep casing onto stuffing horns at the packing plant would be eliminated.



STEPS in formation of edible casing. From dried seaweed, kelp (left), purified sodium alginate (center) is produced. Alginate then is extruded into seamless tubing (right).

Stuffed pork sausage can be linked on existing machines in the usual way, and the links can then be handled under regular processing conditions.

Pork sausage links fried with this casing at a recent Chicago demonstration for meat packers were appetizing in appearance. Too, they retained their tasty juices. The casing was not tough, and it was readily chewed with a little "snap."

Initially proposed is to make this casing in several of the smaller sizes–in the range of 18-24 mm. stuffed diameter.

Making it in larger diameters is believed to pose no problem.

AUTHENTICATED

CASE HISTORY

From the current files of the Hoerner Corporation

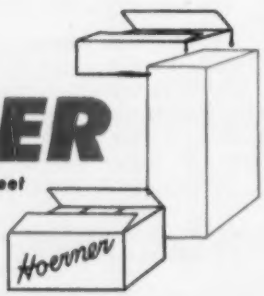
HANDLING COSTS REDUCED WAREHOUSING SPACE SAVED*

The Cooper Manufacturing Co., of Marshalltown, Iowa, is famous for its "Cooper Klipper" and "Cyclo-Mo" power mowers — "Gaskoid," "Ferrobes" and "Korkite" gaskets. And for 15 years Hoerner Packaging Engineers have helped the company keep its packaging costs to a minimum with maximum protection for the contents — from mowers to gaskets. But in addition to savings in package design, Hoerner's and Cooper's have worked closely together to save warehousing space and handling costs through pin-point delivery of boxes dove-tailed with production.

*The Hoerner Packaging Engineer responsible: F. C. Supinger

HOW A HOERNER PACKAGING ENGINEER CAN HELP YOU!

If your company packages things, whatever they are, why not ask us to have a Hoerner Packaging Engineer come in and make an objective study of your packaging operations. It won't cost you a cent or obligate you in any way. It can mean an increased margin of profit through savings in labor and material costs, prevention of shipping losses. Just write to one of the Hoerner plants listed below.



SALES OFFICES: 209 S. LaSalle St., Chicago 4
50 E. 42nd St., New York 17

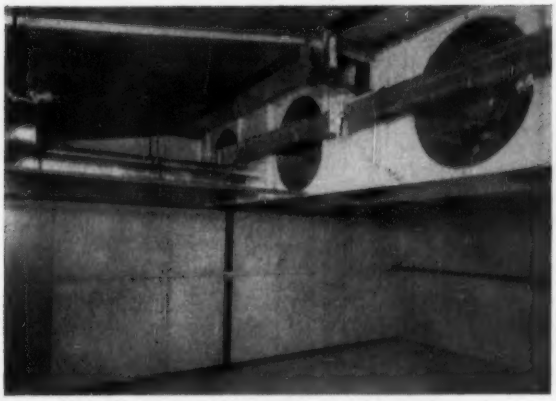
HOERNER BOXES, INC.

GENERAL OFFICE: 600 Morgan Street
Keokuk, Iowa

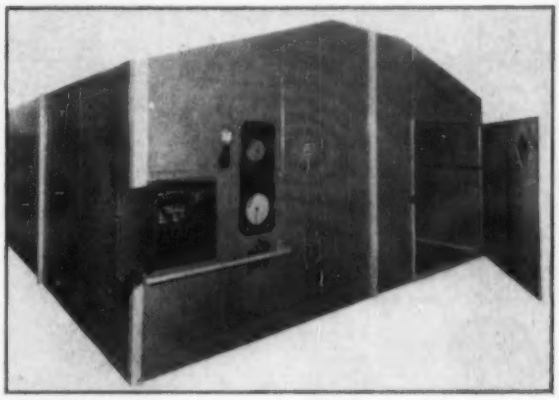
PLANTS—Keokuk, Des Moines and Ottumwa, Iowa; Sand Springs, Oklahoma; Minneapolis, Minnesota; Fort Worth, Texas; Sioux Falls, South Dakota; Fort Smith and Little Rock, Arkansas

Packaging Engineers Designers and manufacturers of corrugated boxes.

Fans, Coils, Dampers . . . **. . . Simply Controlled Outside**



BATCH-TYPE spaghetti dryer has heating coils and dampers positioned to assure thorough mixing of fresh and circulating air. Room holds 45,000-96,000 lb. on racks. Air is sampled continuously by sheet-metal pipe (left).



EXTERIOR view shows time-schedule controller (Taylor) and electric control equipment with automatic fan-reversing mechanism. Fans throw same amount of air in either direction.

Controlled Drying Technique

Speeds Production, Protects Quality

Sharp cut in process time achieved in advanced macaroni and spaghetti dryers that feature precise regulation of dry and wet bulb temperatures. System assures good texture and color

W. G. & C. M. HOSKINS

Industrial Consultants, Glenn G. Hoskins Co., Libertyville, Ill.

Today, the processor who still extends his drying time for macaroni and spaghetti to 72 or more hours continues to lose ground—considering pressure of space and labor charges at current rates.

But he can readily reverse this loss with use of a modern dryer that couples best air circulation methods with an accurate dry and wet bulb temperature control system. These units permit the maximum drying rate—twice as speedy as former methods—while assuring consistent good quality.

In these dryers, moisture is removed uniformly to prevent checking (cracks) and deterioration of color in the product. Modern practice is to handle long goods in a batch dryer, while the continuous type is preferred for short-cut goods.

We will detail construction, operation, and control of both units. First, however, let's examine the general drying problem which makes accurate control necessary to set the drying pace and protect the product.

Drying Rate Critical

It may seem curious that macaroni, spaghetti, or egg noodles, which contain 32% moisture and are quite firm when they leave the press, have conventionally taken as long as 72 hr. to dry to the desired moisture content of 10-11½%. But consider the extreme pressure used in production.

A modern, continuous automatic macaroni press exerts about 1,500 psi. on the product just before it is extruded through the die. Result is a very dense and compact dough whose surface is smoothed and sealed in passing through the die. And the combination of these factors seals in moisture.

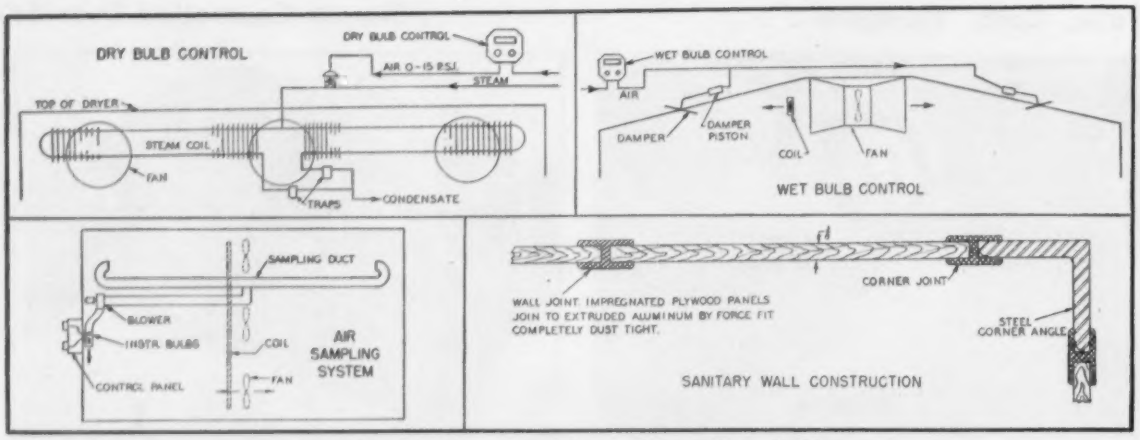
If drying proceeds too fast, the surface becomes dry while the inside is still moist. Later, moisture in the interior tries to escape and travels to the dry surface, which has previously shrunk. This causes the surface to expand with the additional moisture and pull itself loose, leaving cracks or checking.

On the other hand, checking can also be caused after the product has been dried to the point where its interior wall or strand is no longer plastic. In this case, drying too fast shrinks the surface.

First type of checking is called *compression check* and is very deep. It results in the product falling apart, either before or during cooking. Second type, known as *tension check*, causes an undesirable white-appearing surface that detracts from sales appeal.

Previous solution to this problem was the extremely slow drying, which allowed moisture to diffuse evenly through the product and out through the surface.

Many of the older style dryers were operated with relatively slow moving fans. These were used particularly for products like long spaghetti and long macaroni, which are dried by hanging over sticks on racks. And checking



Controls and Construction—Long-Goods Dryer

was kept to a minimum by holding down the rate of air movement in and out of the room. Thus, moisture from goods kept humidity high enough so that drying proceeded very slowly. Actually, in these rooms risk of spoilage more frequently arose from molding than from checking.

There have been many steps in the development of today's macaroni and spaghetti dryer (room)—namely, improved air circulation, more airtightness for better control, and use of hand-set dampers. These have combined to cut down drying time by providing more control over the moisture factors.

It then becomes a natural additional step to combine best methods of air circulation with an accurate dry and wet bulk control system. In such a unit, drying conditions are the same for each run, regardless of outside weather.

Long-Goods Dryer

Most practical way to dry long spaghetti and macaroni is to hang it over sticks (⅞ in. dia. by 54 in.) placed on racks equipped with casters for portability around the plant. The long goods room is designed to dry 15 to 24 trucks, each holding approximately 300 lb. dry weight. For optimum air flow, the dryer is slightly larger than required to hold all of the trucks put in.

Drying racks are arranged in the room so that air flow is parallel to the sticks, and passes around the goods. Roof and spaces at the end of the dryer are arranged so that air flow across the width and from top to bottom is even. This is extremely important for keeping a uniform drying rate throughout the dryer.

Although it is desirable to aim at the maximum drying rate, this theoretical maximum cannot be reached. In practice there is a wait for the slower parts of the room. And it is necessary to hold back goods in those parts that might get more circulation.

Used in the long-goods dryer are special fans designed for equal air flow in both forward and reverse directions. Wet bulb temperature of air passing through the goods rises as it travels from one end of the room to the other. Therefore, that end which air strikes first dries fairly rapidly, while the other end may not dry at all during some parts of the cycle.

To correct this condition, automatic controls reverse direction of the fans every 2 hr. This alternates the drying rate for goods at the end of the dryer and lets the center operate at a rate close to the theoretical optimum.

An additional requirement of the fans is they have good pressure characteristics to overcome resistance of the goods to air flow.

Temperature Control

One critical point in design of this batch-type dryer is correct sizing of a special steam distributing tube coil. Temperature control is obtained by metering steam to this coil, which runs the entire width of the dryer. If the coil is too large, temperature quickly cycles about the control point before the coil turns on.

The properly sized coil is near the required capacity, and the steam valve is also accurately gaged. Thus, temperature in the dryer varies gradually and stays close to the control point.

Dry bulb control is provided by a steam coil which has a modulating steam valve regulated by a pneumatic controller. Steam turns on when the instrument calls for additional heat, and off when the heat is high enough.

Wet bulb control is by dampers built into the dryer, both for short and long goods. When the product loses so much moisture that air is above the desired wet bulb temperature, this controller opens exhaust and intake dampers to release moist air and bring dry air from around the dryer. Dampers are carefully sized to prevent marked cycling of the wet bulb temperature.

The process is simple, inexpensive, and effective. But instruments used must be very accurate, since it is necessary to control both dry and wet bulb temperatures within $\pm\frac{1}{2}$ deg. F.

Dryers developed by our concern (Glenn G. Hoskins Co., Libertyville, Ill.) are simple in principle. Basic idea is that they operate slightly above normal ambient temperatures. Thus, incoming air is preheated to keep a spread between the dry and wet bulb temperatures. This spread provides the required "drying head."

Construction is tight to keep air leakage negligible in normal operation. And moisture lost from the product holds the wet bulb temperature in the drying chamber to the controlled point.

Another important part of this

TYPICAL Operating Schedule for Batch-Type Dryer

Time (Hr.)	Wet Bulb	Dry Bulb	Depression
0-½	90	95	5
½-8	89	95	6
8-15	88	95	7
15-19	86	95	9
19-23½	84	95	11
23½-25½	82	95	13
25½-27	80	Heat shut off	..
27-32	70	Heat shut off	..
32-36	80	Heat shut off	..

Want to make sugar crystals do tricks?

Atlas food ingredients can give you a new look at how to control the crystallization of mixed sugar systems in your product.

Suppose you're making cake icings, cookie fillings, marshmallows or some other food product that you'd like to have creamier and softer. Sorbitol can often produce unique effects. Sorbitol tends to slow crystallization. Its modifying action on the crystal structure of mixed sugar systems gives you improved and longer-lasting softness and creaminess.

Or suppose you want to impart finer texture and better opacity to cookie coatings, candy coated gum or panned goods. Atlas food emulsifiers can often do the trick. They work in the opposite direction . . . tending to speed crystallization and thus produce smaller sugar crystals.

We'll be glad to explore the possibilities of using Atlas food ingredients to control crystallization in your product. Write or call Atlas today for a discussion of your problem.

NEW IDEAS
FOR BETTER FOODS
through Atlas food ingredients for

stabilizing moisture content
controlling sugar crystallization
improving whipping ability
dispersing fats and oils
starch modification
fat modification
wetting solids

FOOD INDUSTRY DIVISION

ATLAS

CHEMICALS DEPARTMENT
ATLAS POWDER COMPANY
WILMINGTON 99, DELAWARE

ATLAS POWDER CO., CANADA, LTD.
BRANTFORD, CANADA

For more information, use coupon on last page.

How to get

New COE models are available in 3 series of 4 models each. Wheelbases from 99 to 153 inches. GCW ratings, 50,000, 55,000 and 65,000 pounds. Powered by famous INTERNATIONAL Red Diamond engines, including new 201-hp. Royal Red Diamond 501 in CO-220 series.

the Real payload profits

Put any one of the 12 new INTERNATIONAL COE models on your job and you'll get payload profits, plus!

These new trucks are all-truck engineered to give you all the famous features for low cost operation and maintenance that have made INTERNATIONALS first choice of heavy-duty truck buyers for 22 straight years.

Short 76-inch bumper-to-back of cab dimension lets you pull a full 35-foot trailer in every 45-foot limit state, with room to spare. Shorter over-all lengths for given body lengths makes for easier parking and maneuvering in straight truck operation. Better load distribution provides more payload capacity on front and rear axles for more profit in both tractor-trailer and straight truck use. These new COE models offer maximum service accessibility, extra comfort and handling ease, great new visibility and safety—every newest time and money saving feature.

You'll save money, *make* money with any one of these new INTERNATIONALS on your job. Get complete, specific facts from your INTERNATIONAL Dealer or Branch.

Newest COE cab design, employing uncomplicated spring counterbalancing mechanism, swings forward for quick and easy servicing of engine and other units. Cab is big and roomy, with low-level 6-way adjustable seat. Special features, including electric oil level gauge on dash, permit routine servicing without raising cab.

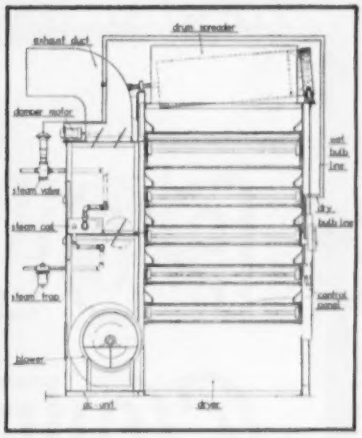
INTERNATIONAL HARVESTER COMPANY • CHICAGO

International Harvester Builds **McCORMICK®** Farm Equipment and **FARMALL®** Tractors...Motor Trucks...Industrial Power...Refrigerators and Freezers

See the season's new TV hit, "The Halls of Ivy," with the Ronald Colmans, Tuesdays, CBS-TV, 8:30 p.m., EST

INTERNATIONAL® TRUCKS

"Standard of the Highway"



BATTERY of Hoskins continuous dryers for short-cut macaroni products—elbows, shells, and noodles. Variable drive (Reeves) permits wide speed changes for products with different wall thicknesses. Right: Schematic diagram shows control elements in sectional view. Mixed conditioned air enters chamber at bottom of dryer.

dryer is the air sampling system. It is desirable to control the condition of air where it strikes the goods. For example, it would be unwise to set the control bulbs at a point where air is fairly stagnant, or where there is only local circulation.

Therefore, a special air-sampling duct is provided to pick up air alternately from one end of the dryer and then the other, depending on the direction of circulation of the main fans. It consists only of a sheet-metal duct running from one end to the other, and with open ends curving back facing into the fans.

At the opening into the sampling duct, facing opposite the direction of air flow, the air pressure causes in-flow. Then a small fan draws the sample from the center of the duct and carries it over the bulbs of the control instruments. This permits the controls to sense conditions at a point just before the well-mixed air strikes the goods.

In this dryer, the control elements —air intake and exhaust dampers and the steam coil—are located to insure thorough mixing of heated fresh air and circulating air before they strike the goods. This is important because any stratification of air dries one part faster than the rest and causes checking at some points in the dryer.

Choice of Controls

Two types of control systems are available for the batch dryer. First is the time-schedule controller (Taylor), and the second is a set of dry and wet bulb indicating controls.

The time-schedule controller is desirable for such operations, since it is necessary to start the drying with a low depression (small difference between dry and wet bulbs). Drying then proceeds at stages, to the point where the depression is quite large and drives the finished moisture of the product down to the required level of 10 to 11½%.

This controller might operate on a schedule such as shown in our accompanying table. It has two cams, one each for the dry and wet bulbs, and cam followers that automatically adjust the control points of the instruments. A small motor in the control unit turns the cam at a predetermined rate so that settings are changed at correct intervals. An "interrupter timer" adjusts total length of the drying schedule from a minimum of 12 hr. to an infinite time.

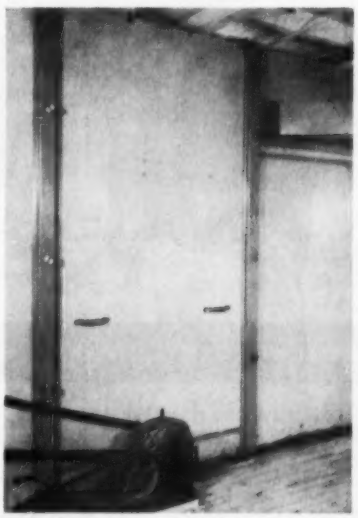
This unit is needed because such products as long macaroni must be dried more slowly than standard spaghetti, while material with thin strands, like vermicelli, can be dried even faster than spaghetti.

The device has proved to be ideal for manufacturers who do not keep a crew in their drying area overnight. When a room is filled, they switch on the unit, and the dryer takes care of itself, without attention, through the entire cycle.

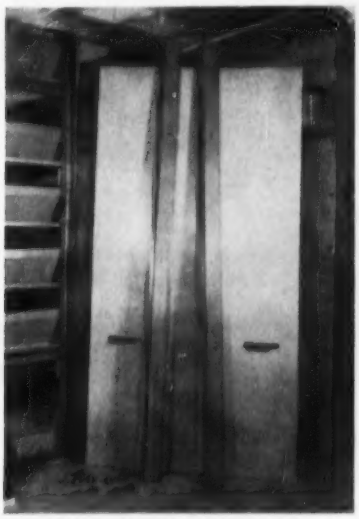
Another effective control system, sometimes used by plants that keep a watchman or a supervisor on hand overnight, is a combination of dry-and-wet-bulb indicating controllers. These have dials for setting the different control points. With this system, a watchman adjusts the control points at the required intervals.

Our design for a long goods drying room gave specific attention to sanitation. Walls are made of plastic-impregnated plywood, which can be washed down with a hose, if desired. There is no false ceiling and all sur-

(*Turn to page 206*)



PLASTIC-IMPREGNATED plywood panel on short-goods unit . . .



. . . **QUICKLY** comes off for sanitation and maintenance.

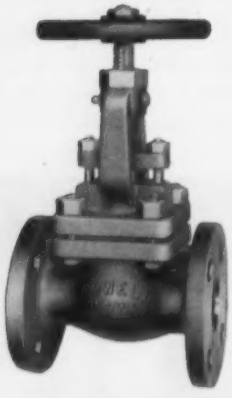
POWELL VALVES . . . THE COMPLETE QUALITY LINE . . . POWELL VALVES

. . . THE COMPLETE QUALITY LINE . . . POWELL VALVES . . . THE COMPLETE QUALITY LINE . . .

FIG. 2342—Flanged End Bolted Cap Swing Check Valve for 150 Pounds W.P.

POWELL CORROSION RESISTANT VALVES

FIG. 2495—Double Disc Flanged End O.S.& Y. Gate Valve for 150 Pounds W.P.



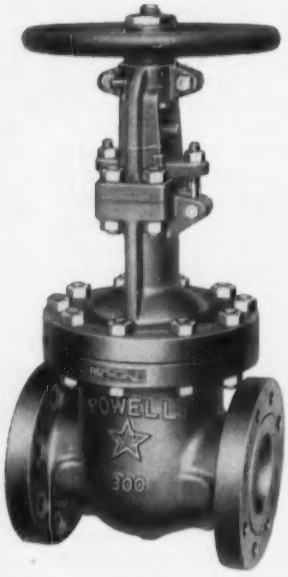


FIG. 2475—Stainless Steel O.S.& Y. Globe Valve for 150 Pounds W.P.

FIG. 3003SS—High Pressure Service Alloy Steel Gate Valve for 300 Pounds W.S.P.

POWELL VALVES . . . THE COMPLETE QUALITY LINE . . . POWELL VALVES

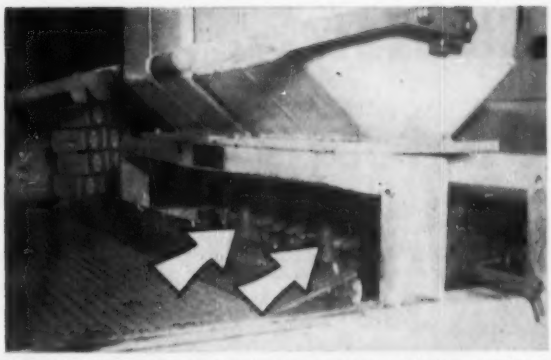
Powell can supply exactly the corrosion resistant valves you need . . . in a WIDE VARIETY of metal and alloys and all designs. You can be certain that every Powell Valve will give you dependable flow control.

Shown above are a few Powell Corrosion Resistant Valves. Investigate these . . . and the *complete* Powell line of quality valves that have a proven record of long, dependable service.

If no distributor is near you, we'll be pleased to tell you about our complete line, and help solve any flow control problem you may have. Write . . .

The Wm. Powell Company, Cincinnati 22, Ohio . . . . . 109th year

OLD WAY: This worker and another turned out only 40 doz. Long Johns hourly in former hand production.



NEW WAY: But up to 15 times as many, of better texture, are made with special cutters (arrows).

Long John Donuts At 10 Dozen a Minute

Chicago bakery engineers its standard machine to make long items continuously — thus multiplying output, saving labor, and upping quality, too . . . Also devises automatic system that accurately controls dough weights

LARRY FLOWERS
Plant Engineer, Emil Donut Corp, Chicago

Highly satisfactory operations of our donut machine on top-quality yeast-raised Bismarcks and round donuts was the basis of our new Long John move at Emil Donut Corp.

On the items named, we had excellent production (700 doz./hr.) with only one man running the equipment. ► **Yet efficient though this multi-function operation is—in extruding, proofing, and frying the dough, then glazing and cooling the finished donuts—there were still two further performances that we sought:**

We wanted cutters that could be applied to this machine for the extrusion of Long Johns. And we also desired an automatic system for controling air pressure to the two hoppers feeding donut dough to the eight cutters.

Up until now, it took two men to turn out approximately 40 dozen Long Johns. One worker had to mix the dough, which then was passed through a dough sheeter, flour-dusted, divided into 28 strips with a hand-operated rotary cutter, scaled, trimmed with a circular knife, and loaded into a proof box.

Then the second man fed dough pieces into a submerged-type fryer and finally loaded them onto cooling racks.

Quality Also Improved

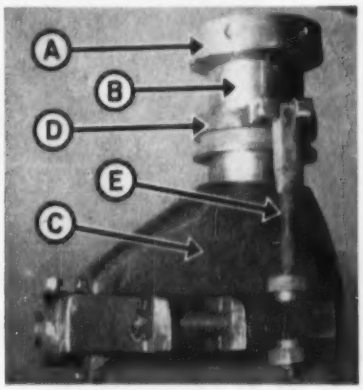
But now that we've designed a special dough cutter for Long Johns, we can turn out—with six cutters and only one man—up to 10 dozen a minute, or 600 dozen hourly.

What's more, we have found that these continuously made Long Johns are of notably better texture than those bench-made.

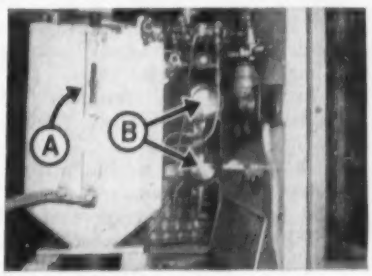
In operation, dough is still fed from closed hoppers (in the same manner as for Bismarcks and round donuts) to our specially designed cutters. Compressed air is introduced to build up a pressure of 40 psi. in the hoppers.

At this point, the new cutters take over. Dough (4 oz.) first enters each cutter's 1¾-in. dia. nozzle, to expand, under pressure, in the cutter's body (2x3x5 in). At the bottom of the cutter, dough is discharged through a ¼x4in. depositing slit, which is flanged

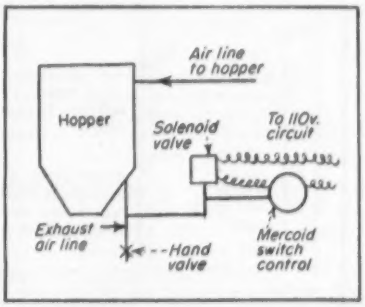
(Turn to page 168)



DETAILS of cutter. Threaded collar (A) is attached to donut machine. Dough feeds via nozzle (B) into body (C) of cutter. Up-and-down action of ring (D), through rod (E), actuates half-circle cutter in bottom of unit.



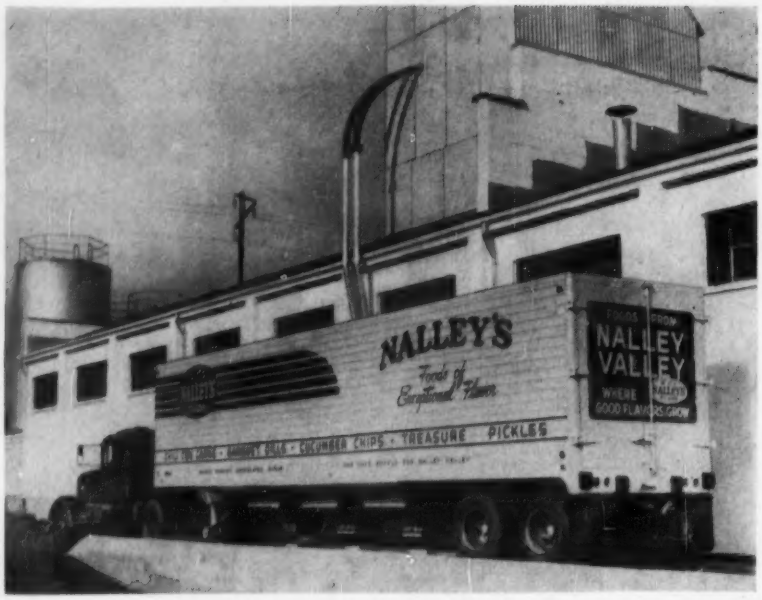
AIR PRESSURE in hopper (A) is automatically controlled by mercoid switches (B) and solenoids.



LAYOUT of automatic control system for maintaining constant pressure to form the uniform doughs desired.

Carries Payloads *Every Run*

—by virtue of special convertible design in which a quick "deck fold" switches case-goods accommodations into a capacious bulk-sugar bin



C. R. HAVIGHORST
Senior Associate Editor, "Food Engineering"

"Why not design a trailer having decks that can be converted into bulkheads? Then, by a simple switch, we can use the unit not only for transporting finished cased goods but also, on the back-haul, for carrying bulk sugar!"

This was the novel counter proposal advanced when executives of Nalley's, Inc., Tacoma, Wash., sat down in a management conference to consider purchase of a tank-truck for hauling bulk granulated sugar.

The response was immediate: "A trick truck with a false floor? That's a good idea!"

Call it, then, a case of "management proposes, the engineer devises"—the fast one-two action that has marked so many of the advances made by this company. That's one thing about the management at Nalley's—instead of resisting changes, it invites them. Especially if the idea seems fundamentally sound and advantageous.

A Standing Need

The men who staff the transport department here are old hands at this game. They operate 153 pieces of rolling equipment, representing an original cost in excess of $400,000. This equipment is used for transporting merchandise throughout the entire Pacific Northwest.

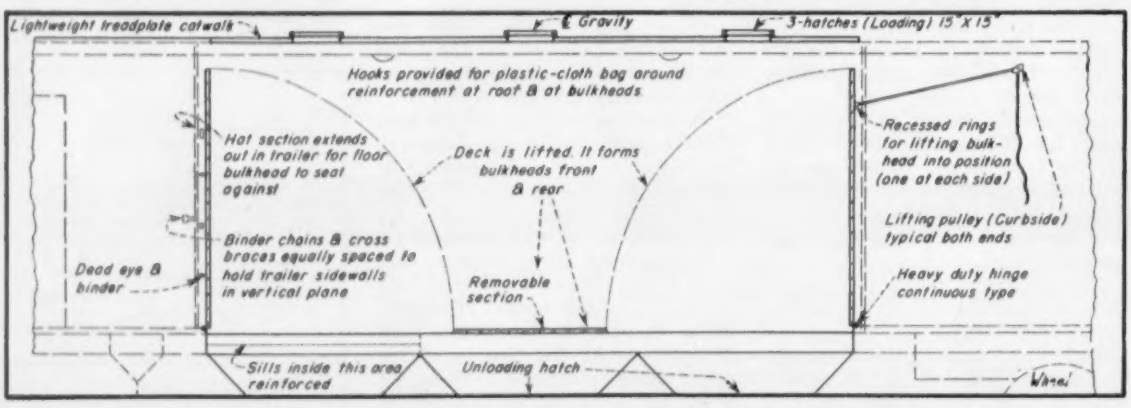
Over a period of some 30 years of hauling, the transport department has accumulated a lot of valuable experience and trucking know-how. And, it was heartbreaking to Ray Landon, manager of this department, when the big tractor-trailers had to make an empty, or only partly laden, back-haul. Pallets and cased glass being toted to the plant never seemed to make up a payload. Real tonnage was needed.

As an example, such a convertible trailer could transport a load of finished products to Nalley's Spokane, Wash., branch. Then, on the return trip, it would be converted, and at the Moses Lake, Wash., U & I Sugar Co. refinery, pick-up a payload of 40,000 lb. of sugar and deliver this to the Tacoma, Wash., plant.

The manager of the transport department took this idea to experts of the Brown Trailer Co., Spokane, Wash., and asked them if they could design and build this convertible trailer. They could, and did. Also consulting with the builder on this project were the engineering department of Nalley's and the U & I Sugar Co., Salt Lake City, Utah.

Major changes in the exterior of

(Turn to page 158)


Lightweight treadplate catwalk
℄ Gravity
3-hatches (Loading) 15' X 15'
Hooks provided for plastic-cloth bag around reinforcement at roof & at bulkheads
Hat section extends out in trailer for floor bulkhead to seat against
Deck is lifted. It forms bulkheads front & rear
Recessed rings for lifting bulkhead into position (one at each side)
Lifting pulley (Curbside) typical both ends
Binder chains & cross braces equally spaced to hold trailer sidewalls in vertical plane
Dead eye & binder
Removable section
Heavy duty hinge continuous type
Sills inside this area reinforced
Unloading hatch
Wheel

CONVERSION ELEMENTS are depicted in this side-view schematic of the new trailer.

HERE IS AN

Economy

THAT WILL-

INCREASE YOUR SALES!

Are you selling "country style" thick sliced bacon in two pound packages? You can make it a market leader by using Daniels flexible packaging. We will create a beautiful wrap on glistening Cellophane that keeps your packaging costs (and your retail prices) at an absolute minimum.

We invite Inquiries

Daniels
MANUFACTURING CO.
RHINELANDER, WISCONSIN

There is a **DANIELS** product to fit your needs, **printed in sheets and rolls** . . . transparent glassine • snowdrift glassine • superkleer transparent glassine • lard pak • bacon pak • ham pak grease-proof • sylvania cellophane • laminated papers • special "Heat-Seal" papers.

PREFERRED PACKAGING SERVICE

SALES OFFICES: Rhinelander, Wisconsin
Chicago, Illinois . . Philadelphia, Pennsylvania . . Akron, Ohio
Denver, Colorado . . Dallas, Texas . . Los Angeles, California

creators · designers · multicolor printers

For more information, use coupon on last page.

In Behalf of Progress . . .

Packaging Poses "Chemicals" Problem

If there is such a thing as a prize-winning problem, chemicals-in-foods is it.

Yet new additives for improving quality, and retaining it longer, constitute keystones of much significant progress in foods.

And the intentional addition of new substances to foods is only a small part of the headache. On the agricultural side of the food plant you have the use of insecticides—with their contaminating residues. On the distribution side comes packaging. Here much progress has been made through the development of new basic materials and the use of additives to improve the performance of older materials.

While the food manufacturer does not have direct control over either insecticide residues or chemicals in packaging materials, he nevertheless has a vital stake in their possible effects on his products.

In the spotlight at the moment is the packaging materials problem. Suppliers and big users have been concerned for some time about the question as to the possibility of harmful effects of chemicals in the materials. So also have the Food & Drug Administration and the Food Protection Committee of National Research Council.

The Food, Drug & Cosmetic Act specifies that a food is adulterated if its container is composed, in whole or in part, of any poisonous or deleterious substance which may render the contents injurious to health.

And this Act further states that any poisonous or deleterious substance added to any food, except where such substance is required in the production thereof, or cannot be avoided by good manufacturing practice, shall be deemed unsafe.

When such substance is required or cannot be avoided, then the Administrator shall promulgate regulations limiting the quantity therein to such an extent as he finds necessary for the protection of public health. And such standards will take into consideration the other ways in which the consumer may be affected by the same or other poisonous or deleterious substances.

It is most difficult to prove that any questionable substance is required, and should be tolerated, other than insecticide residues. Here, no one will debate the fact that farmers must use chemicals to protect crops from insects.

But F&DA sees little justification in adding any doubtful substance to a manufactured food as an ingredient. Consumers can have plenty of good food without benefit of such an "improvement."

Apparently F&DA takes pretty much the same attitude in respect to chemicals in packaging materials. And so long as the Administrator is a right-minded, sincere fellow—as he is now—one could hardly argue against that conservative viewpoint.

Trouble is, there always is the chance that a powerful government agency will become unreasonable. And if that should happen, the door is wide open to damaging restrictions on packaging materials for foods.

With the fast pace in the development of new packaging materials, and the improvement of old ones, many new substances are involved. And the permissivity of these depends not so much on their lack of toxicity as upon evidence to that effect acceptable by F&DA. In other words, a chemical is guilty until proved innocent. And while there may be adequate proof to satisfy the manufacturer and user of a packaging material, F&DA is not necessarily convinced.

Well, if you were charged with F&DA's responsibility for protecting the public health, you would be hard to convince, too.

But we have only begun to measure the size of the problem. The situation is made extremely complex by this question: How much of a chemical in a packaging material for a particular food can be picked up by the food itself?

The fat in one food will act as a solvent for some chemicals. The moisture in another food will pick up something else. Temperatures to which the food and its package are exposed in the warehouse, in distribution, and on the kitchen shelf have an effect. And time is always an important factor in the extent of a chemical action.

Just to round out the picture, add the possibility that a chemical in a packaging material could combine with something in the food to form a new compound with different toxicity characteristics.

As for the economics of settling all these points—one company already has spent more than $200,000 in evaluating the safety of its packages.

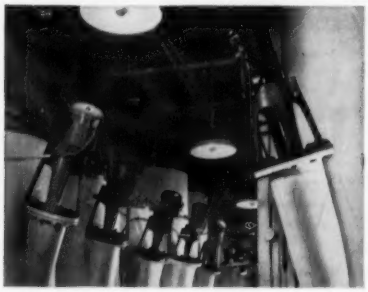
Food manufacturers may put it up to their material suppliers to keep any doubtful chemicals out of packages. But food men must take an active hand in working out the problems. They should cooperate with the suppliers, the Food Protection Committee, and F&DA.

What's more, they should lend their technical knowledge and influence in the direction of more definite and workable packaging material provisions of the new federal food legislation expected to come up in this Congress.

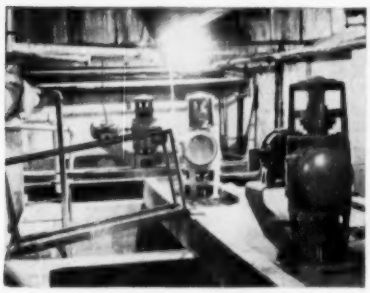
As the provisions stand now, they are subject to impractical and damaging interpretations.

Unreasonable interference with packaging progress must be avoided. So many materials of new chemical composition must be used. And the same for new coatings to increase product shelf-life.

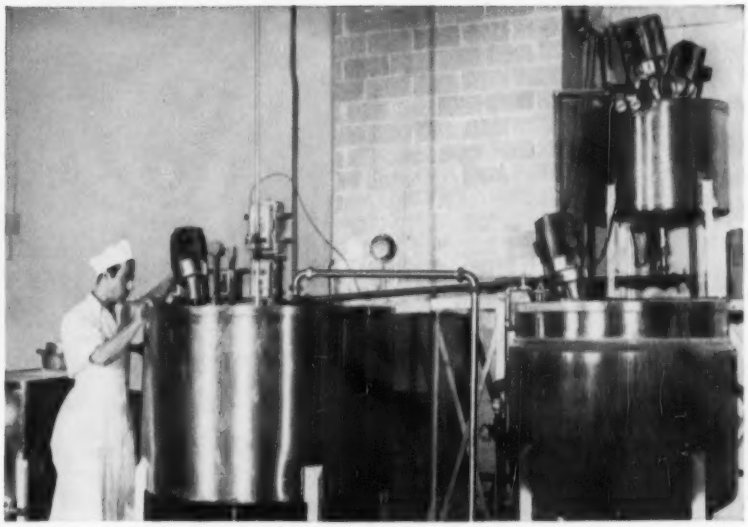
YOU CAN USE A LIGHTNIN Portable Mixer on any open tank, kettle, or other vessel. Shaft and propellers are easily removed, interchanged. Mixer swings fully out of tank for easy cleaning. Thirty models to choose from. Sizes ⅛ to 3 HP.



LIGHTNIN top entering propeller mixers, for open or closed tanks. Sizes ¼ to 3 HP.



LIGHTNIN turbine and paddle mixers, for big mixing jobs, fit any open tank or closed pressure vessel. Full range of speeds, impellers, materials of construction. Sizes 1 to 500 HP.



STIRRING chocolate marshmallow product with LIGHTNIN Mixers

Guaranteed to mix fluids the way you want 'em mixed

You get the exact uniformity you want—as quickly as you want—when you mix fluids with LIGHTNIN Mixers.

That's because every LIGHTNIN Mixer is *guaranteed* to do the job you expect it to do—or you get your money back.

LIGHTNIN Mixers are the flexible, safe way to blend liquids, make up syrups, add flavors, dissolve powders and crystals, beat pulps and suspensions, stir products while cooking—and do dozens of other mixing jobs at low cost.

Flexible—Because LIGHTNIN Mixers are built of standard parts and can often be adapted to different mixing jobs, should your process ever change.

Safe—Because LIGHTNINS are equipped with ball-bearing motors, extra outboard shaft bearings, and other mechanical "extras" for long life. Many of the thousands of LIGHTNINS in service today have operated more than 20 years.

For quick help on any fluid mixing problem, just let us know the materials you are mixing, and the results you want to accomplish. It costs you nothing to get the facts—and there is no obligation. Write us today, won't you?

"Lightnin® Mixers"

GET THESE HELPFUL FACTS ON MIXING

LIGHTNIN Catalogs contain practical data on impeller selection; sizing; best type of vessel; installation and operating hints; full description of LIGHTNIN Mixers. Yours without obligation. Check and mail coupon today.

MIXCO
fluid mixing specialists

- ☐ DH-50 Laboratory Mixers
- ☐ DH-51 Explosionproof Laboratory Mixers
- ☐ B-102 Top Entering Mixers (turbine and paddle types)
- ☐ B-103 Top Entering Mixers (propeller type)
- ☐ B-104 Side Entering Mixers
- ☐ B-105 Condensed Catalog (complete line)
- ☐ B-107 Mixing Data Sheet
- ☐ B-108 Portable Mixers (electric and air driven)

MIXING EQUIPMENT Co., Inc.
143-b Mt. Read Blvd., Rochester 11, N. Y.

In Canada: Greey Mixing Equipment, Ltd.
100 Miranda Avenue, Toronto 10, Ont.

Please send me, without obligation, catalogs checked at left.

Name _____ Title _____

Company _____

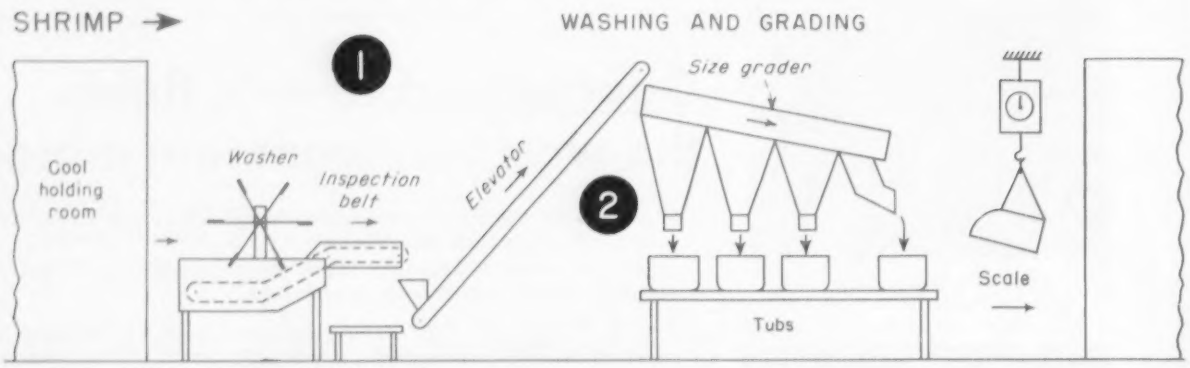
Address _____

City _____ Zone _____ State _____

TURN PAGE FOR FOLDOUT FLOWSHEET →

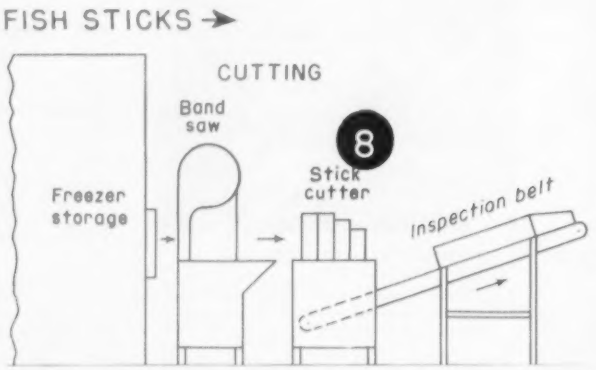
UNFOLD HERE

1 Trucked to SeaPak plant in iced boxes, top-quality fresh shrimp pass through wash tank and over inspection table. Wash water is iced, and chlorinated to 10 ppm.



Sets Pace in Freezing, Breading Operations

Production innovations speed output of top quality shrimp and fish sticks at SeaPak



Top-quality frozen and breaded shrimp and fish sticks are produced with exceptional efficiency at SeaPak's plant on St. Simons Island, Ga.

Iced fresh shrimp are washed, inspected, and mechanically graded into four sizes—points 1 & 2 on flowsheet. Then they go to automatic peeling and deveining machines (4), and a water flume carries the peeled shrimp to a series of three spray-wash belts, the last discharging onto inspection belts.

Pans of the shrimp now go to pinning-line, specially built by SeaPak (5). Here girls slip the tail of each shrimp over a pin on a metal bar to permit individual, quality

For story behind these advanced operations see p. 72.

breading and freezing. Conveyors move pans of shrimp to the workers, and racks of pinned shrimp to the next operation. Tail-suspended shrimp, 325 to rack, are dunked in batter, then transferred to a box and covered with breading mix. Next they go into a −60 F. air-blast freezing tunnel.

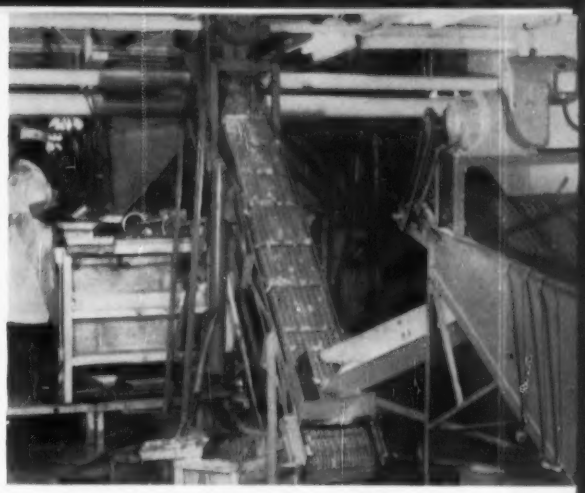
After freezing, the shrimp are knocked off their pins by bumping a rack against a conveyor belt. This belt carries them to girls who do the cartoning and weighing (7). Retail-size cartons then are machine wrapped, placed into shipping cases, and trucked to sub-zero storage.

Breaded Fish Sticks

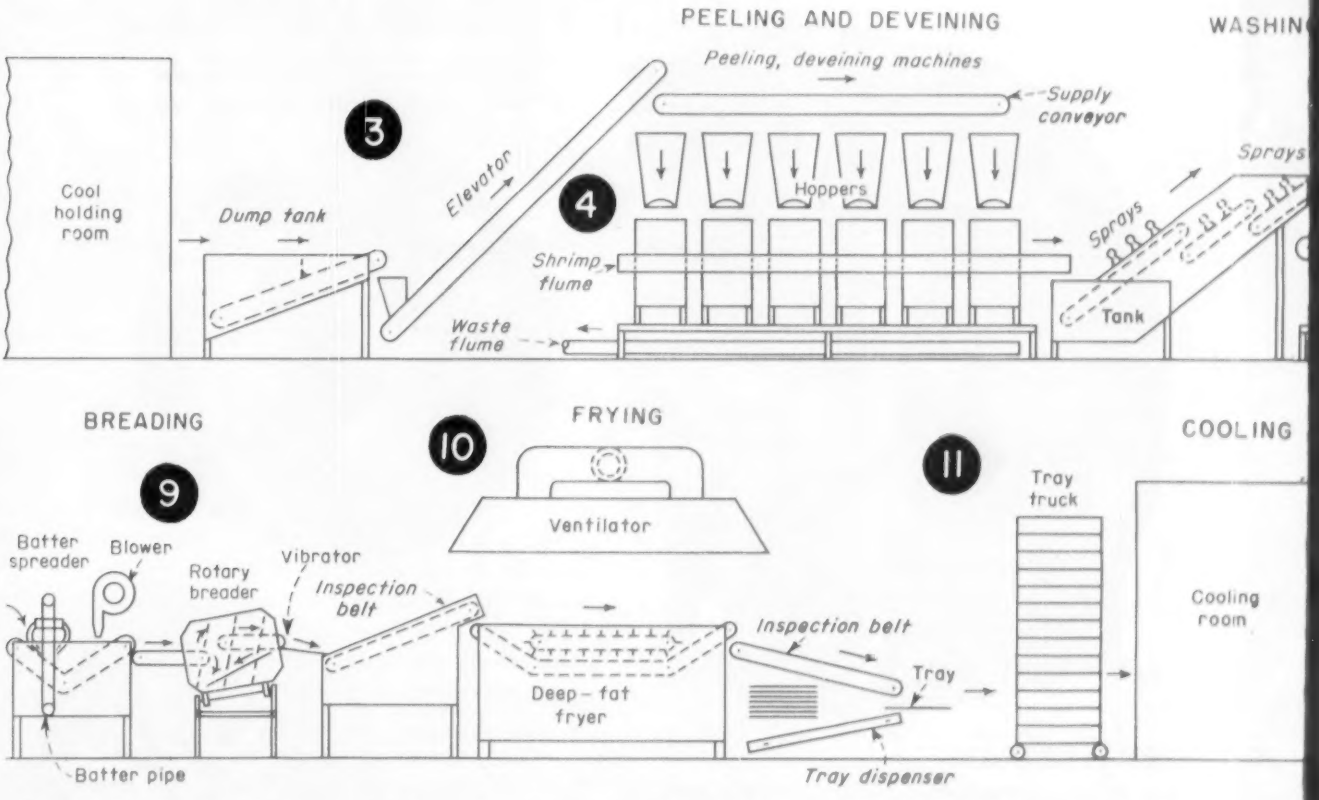
Production on the fish-stick line starts with band-sawing blocks of frozen fillets into slabs. These are inserted into a machine having a reciprocating knife that cuts them into sticks (8).

The sticks are conveyed from cutter, over an inspection belt, under a recirculating curtain of batter, and into a rotating drum that tumbles breading mix over them (9).

2 Size grader has rolls with widening gap between. Four sizes of shrimp fall through into chutes.



3 Dumped into tank of ice water, graded shrimp are conve supplying 12 peeling and deveining machines.



From the breader, the sticks are conveyed past inspectors and into an electrically heated deep-fat pre-cooker.

Coming out of the cooker, the product travels down a conveyor and onto trays mechanically moved in place by a stacker, for automatic loading.

Trays of sticks are placed on portable racks and pushed into a cooler to bring them to room temperature before packaging. Wheeled out of the cooler, the trays are placed on a packaging line conveyor at the same time that machine set-up cartons are fed onto a higher conveyor on the line. As girls fill the cartons, they place them on a middle conveyor which takes them through the check-weighing operation and to a wrapping machine (12).

The wrapper discharges cartons onto a belt, and a pusher mechanism shoves them between the freezer plates (13). Simultaneously, frozen cartons are pushed out of the freezer, onto a discharge conveyor.

8 Fillet slabs are cut into sticks by oscillating knife.

9 Sticks pass under batter stream, cylinder which tumbles breading

e conveyed to elevators

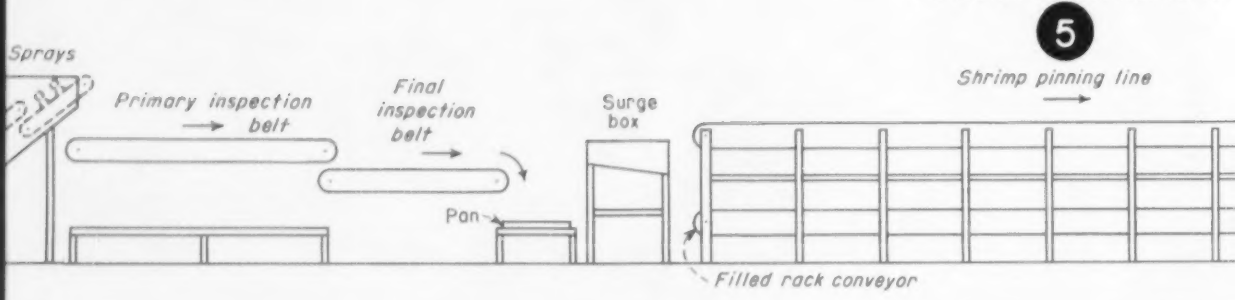
4 Shrimp fed into peeler-deveiner move against knives and water jet.

5 In patented process, shrimp are pinned by tails on efficient conveyorized line.

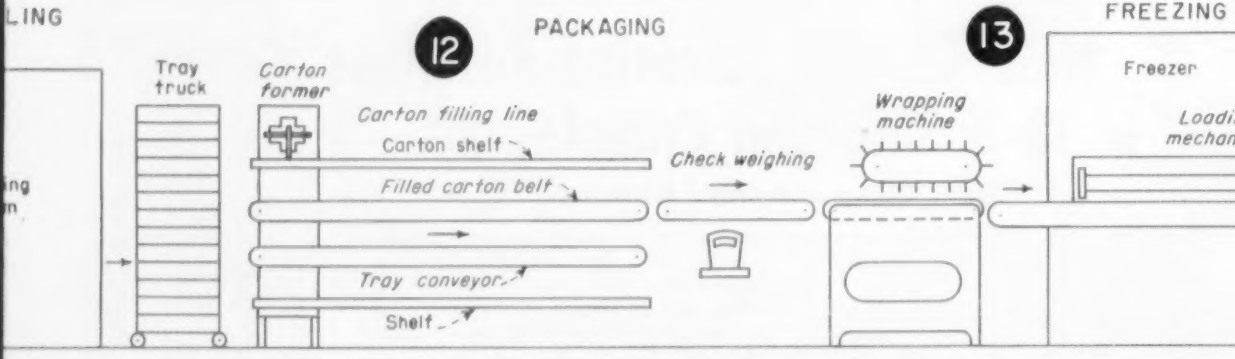
ASHING AND INSPECTION

PINNING ON RACKS

F. E. PICTURE FLOWSHEET N. 73



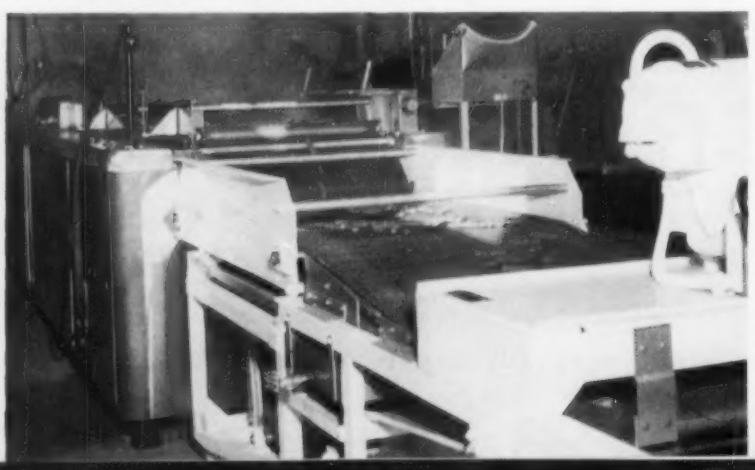
LING



stream, then into rotary ading mix over them.

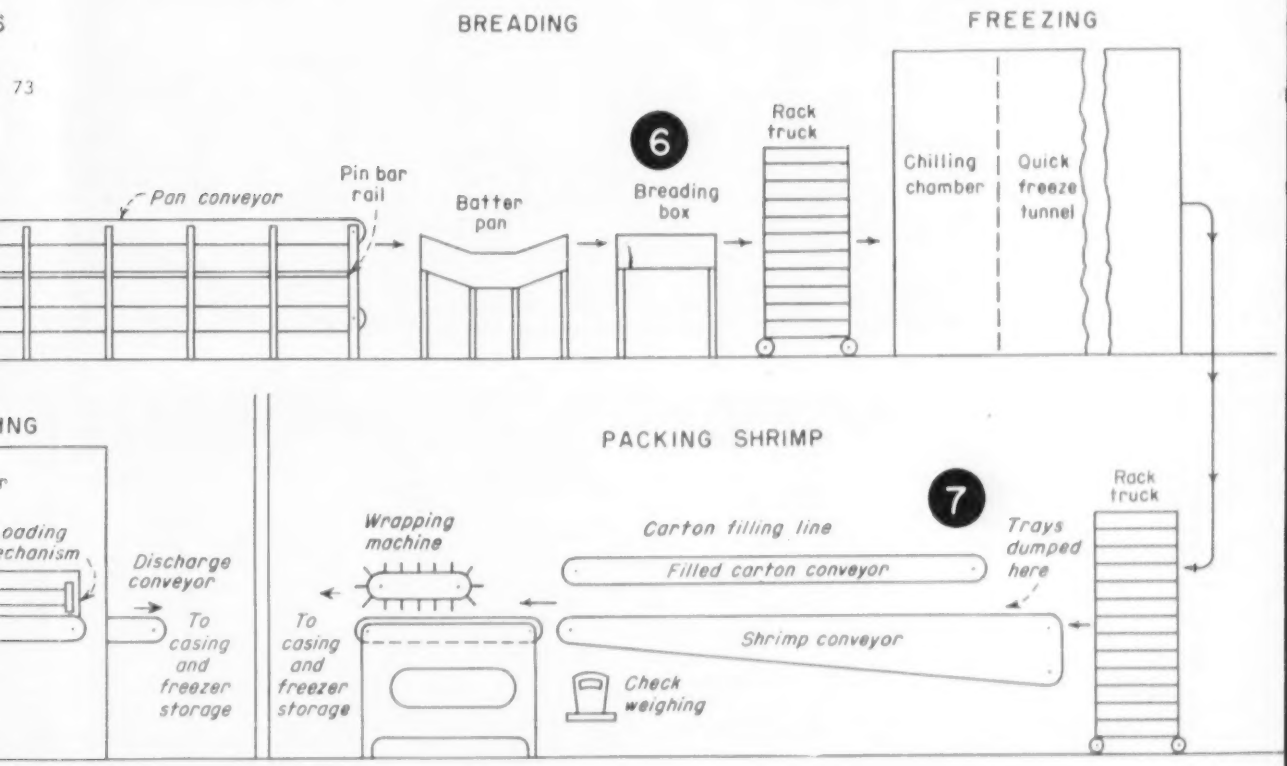
10 Cooker is one-million Btu. electrical unit. Sticks move through 375-deg. oil for 78 sec. and discharge onto trays.

11 Trays are ti for cooling t



6 After immersion in batter, shrimp are covered with breading mix, also part of patented method.

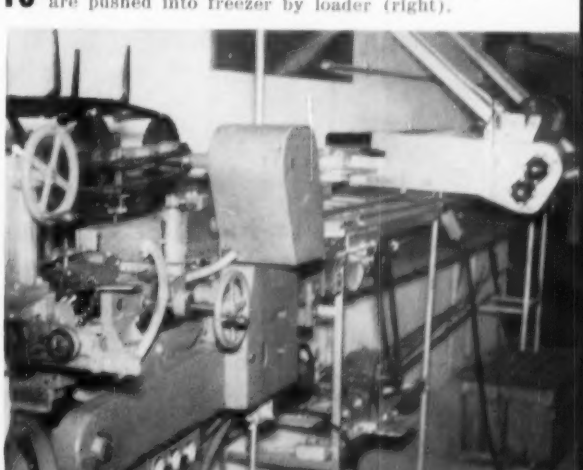
7 Racks of frozen shrimp are dumped on end of conveyor. Then girls pack, checkweigh, and mark count.



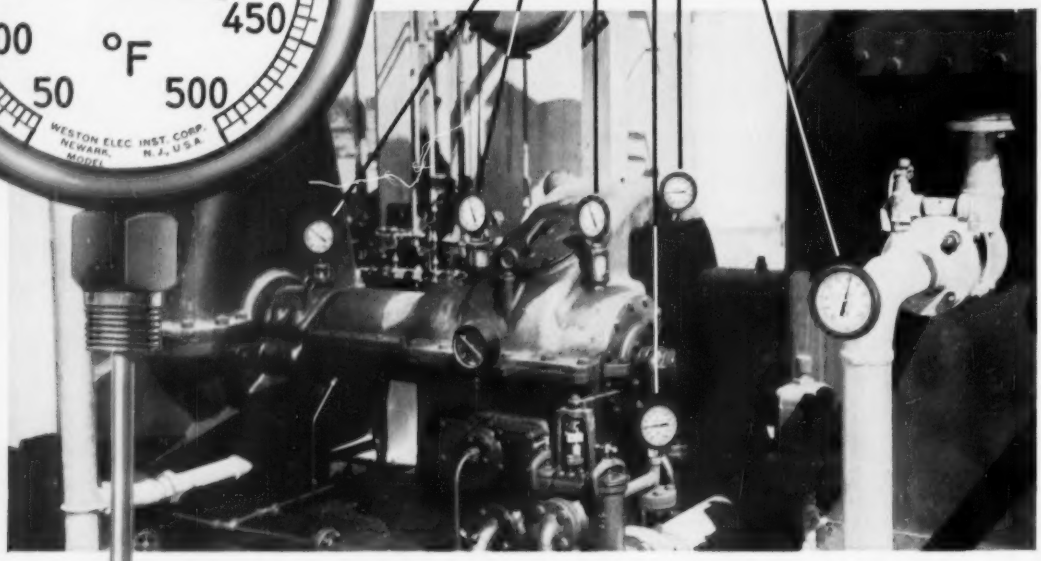
re tiered on racks ing to 70 deg.

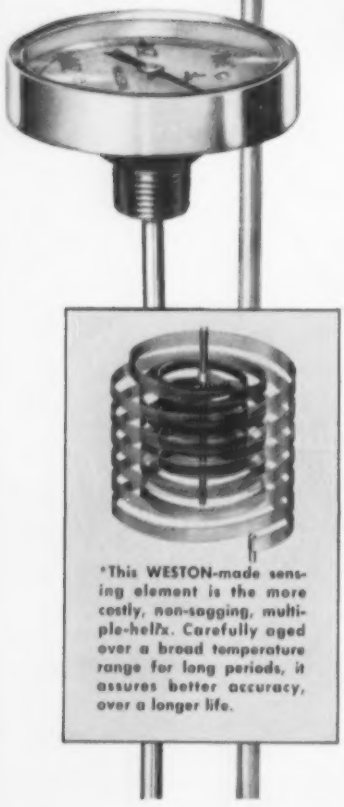
12 Cartons set up by machine (left) are packed on this conveyorized line.

13 Checkweighed cartons pass through wrapper, then are pushed into freezer by loader (right).



AT EVERY CHECKPOINT





*This WESTON-made sensing element is the more costly, non-sagging, multiple-helix. Carefully aged over a broad temperature range for long periods, it assures better accuracy, over a longer life.

WESTON *all-metal* THERMOMETERS

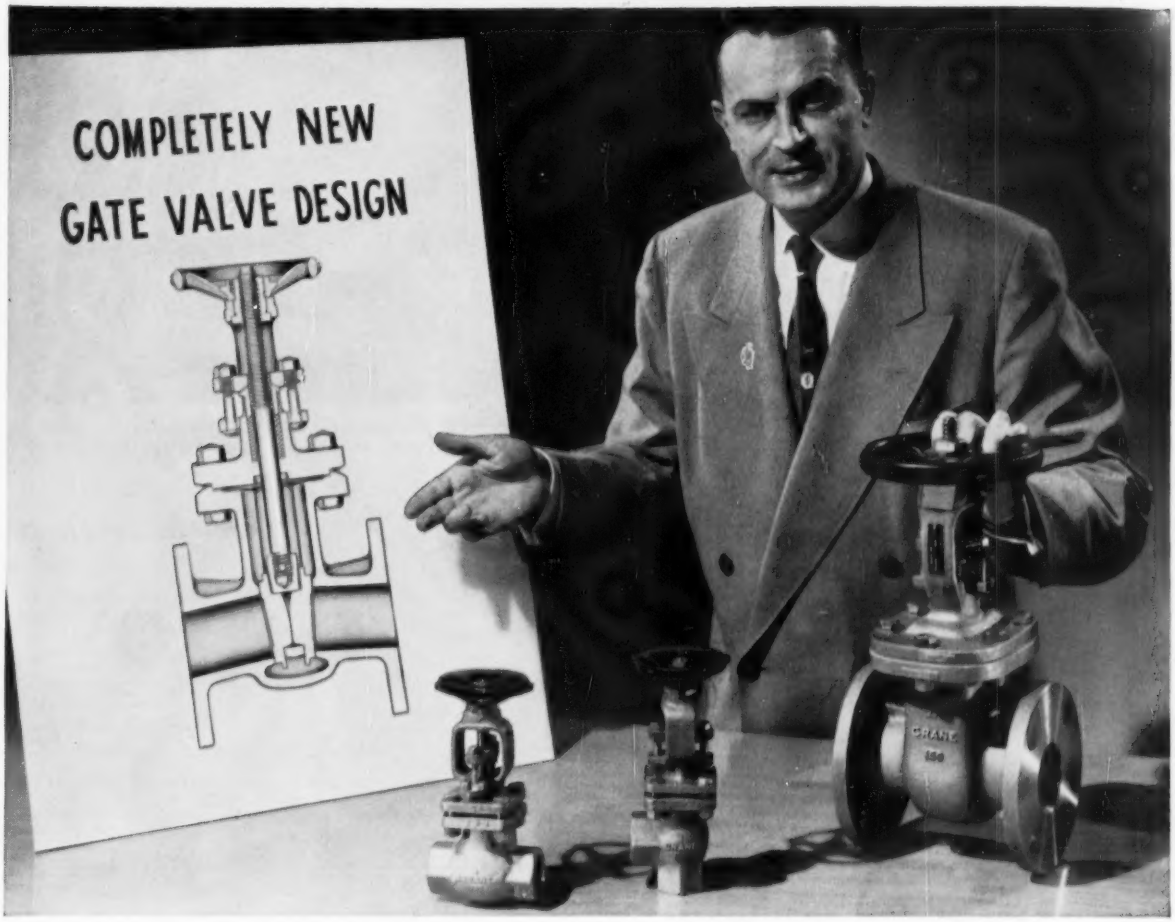
(with Multiple Helix)*

Here's another typical example of how large processing plants have solved temperature checking problems, and cut thermometer costs besides. With a WESTON dial-type thermometer at every checkpoint, temperatures are read at a glance . . . in far less time, and with far greater accuracy. Their sturdy all-metal construction resists breakage, gives them far longer life on operating equipment. And the exclusive WESTON multiple helix employed assures dependable accuracy during all this long life.

Available in a broad selection of types, sizes, ranges and stem lengths, WESTON thermometers are today standard on all types of mobile and stationary equipment and machines, large and small; as well as on piping, conduit, ducts, etc. Ask your distributor, or local WESTON representative for complete information, or write for descriptive bulletin . . . WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey.

WESTON 5537 *Thermometers*

Stocked by leading Distributors



New CRANE Corrosion-Resistant Valves in 18-8 SMo and Craneloy 20

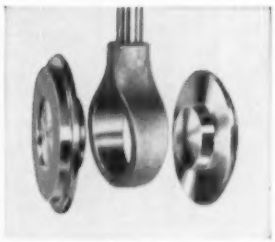
Gate, Globe and Angle Patterns

Few valves for process industries have ever received the quality treatment given this new Crane line.

Note, for instance, the unique yet simple split-wedge disc construction in the gate valves. Those dual identical discs are free to rotate in their holder—the most effective design for resisting galling. The trunnion shape at the back of each disc assures even distribution of closing forces. You couldn't buckle them if you tried.

The globe and angle valves give equally outstanding control of corrosive fluids. A new type disc-stem connection, with minimum clearances, practically eliminates vibration. By placing seating load closer to seats, it provides easier, more accurate closure.

Throughout, these valves are built for better service in your choice of Crane 18-8 SMo Stainless Steel or Craneloy 20. Both lines come with screwed or flanged ends. Full information given in circular AD 2059—available from your Crane Representative or on request to address below.



New split-wedge disc in gate valves combines the benefits of free rotation with uniform seat load pressure.

CRANE CO.

General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

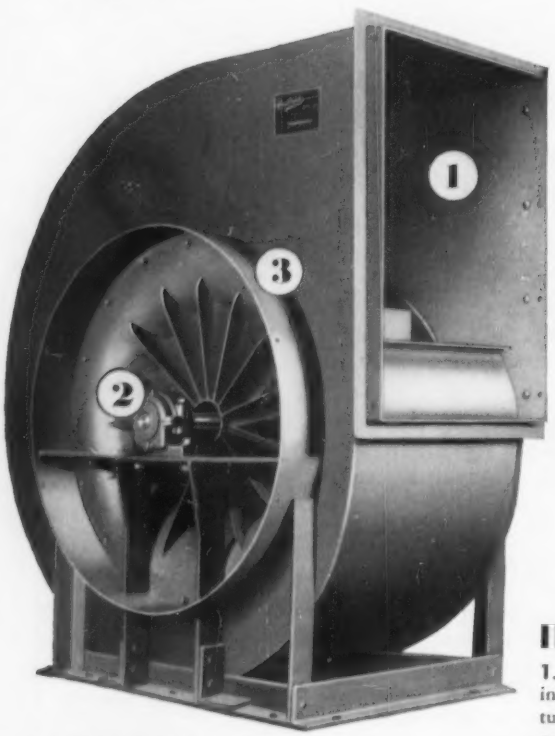
CRANE'S FIRST CENTURY . . . 1855-1955

For more information, use coupon on last page.

HERE'S THE BUILT-IN QUALITY YOU GET IN THIS "Buffalo" FAN

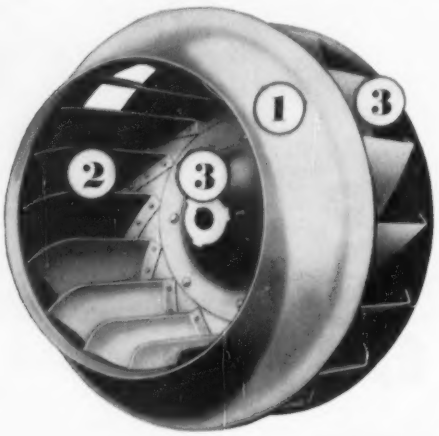
In October of 1953, when we introduced the "Buffalo" Type BL Limit-Load Ventilating Fan, we knew it offered the finest features for quiet, stable, efficient performance in industrial service. Since that time, it has more than measured up to highest expectations.

A study of the "Q" Factor* features illustrated here will show you *why* this fan will give you your money's worth, and more, in *performance.* Further details in Bulletin F-102, your copy upon request.



ROTOR

1. Shroud die-formed to full curvature, matching inlet bell, for proper air flow in wheel.
2. Backward *curved blades* for stable air flow. Die-stamped, welded and riveted for maximum strength.
3. Heavy gauge back plate — extra-heavy hub.

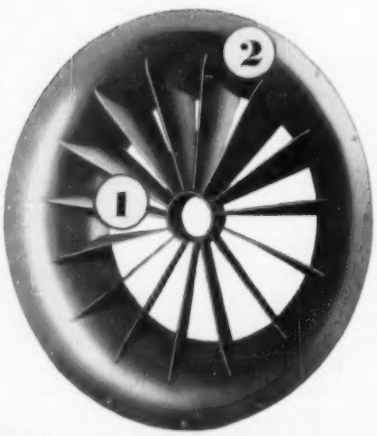


ENTIRE FAN

1. Housing proportioned and streamlined for peak efficiency.
2. Self-aligning bearings; choice of sleeve or anti-friction type.
3. Large, smooth inlet collar for easy duct connection.

INLET

1. Exclusive "Buffalo" inlet guide vanes reduce turbulence and assure full rated delivery, even when inlet conditions are unfavorable.
2. Smooth, die-formed inlet bell matches wheel shroud, further reduces inlet losses.



**The "Q" Factor — the Built-in Quality which provides trouble-free satisfaction and long life.*

"Buffalo"

BUFFALO FORGE COMPANY

152 MORTIMER STREET BUFFALO, N.Y.

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING

FINANCIAL AID TO HIGHER EDUCATION

Business Aid for Our Colleges—Voluntary or Involuntary?

Previous editorials in this series have shown that:

- As a group the nation's independent, privately endowed colleges and universities are in grave financial trouble, and
- There are many different means by which business firms can extend a helping hand to these institutions.

This editorial, one of a series devoted to the financial problems of higher education, submits this proposition: **If business firms do not voluntarily go to the financial aid of higher education, there is every prospect that they will soon be providing more financial support for higher education involuntarily, through taxation.**

If this prospect materializes, one of the basic elements of a well-balanced system of higher education—a strong array of independent colleges and universities—may well be dangerously weakened if not destroyed. And in the process a potentially crucial bulwark for freedom of enterprise in the United States—that same strong array of independent colleges and universities—will be undermined.

Acceptance of these propositions implies absolutely no disparagement of tax-supported colleges and universities. These have an indispensable role in the total system of higher education in the United States. Leaders of these institutions would be among the first to agree that their position is strengthened by a strong system of independent institutions, supported privately rather than by political agencies.

What is the evidence that in one way or another, voluntarily or involuntarily, business will be giving more financial support to higher education? One impressive part of this evidence is provided by the recent rapid increase in the proportion of college and university students attending tax-supported institutions.

Rapid Shift in Enrollment

In the fall of 1952 tax-supported colleges and universities enrolled about 7.5 per cent more students than the independent institutions. In 1953 this percentage was doubled. And in 1954 the tax-supported institutions enrolled 26 per cent more students.

In the case of students entering college for the first time the relative growth of the tax-supported institutions recently has been even more striking. In 1952, the number of beginning students in the tax-supported schools, as reported by the U. S. Office of Education, exceeded those in the independent colleges and universities by 35 per cent. In 1954, just two years later, this figure jumped to 49 per cent.

Why has the proportion of students attending tax-supported colleges and universities been in-

creasing so rapidly? There are many reasons. But a dominant reason is that, in order to keep going at all, the independent institutions have been forced to make large increases in the prices they charge for instruction. The purchasing power of their endowment funds has been cut in half by price inflation. The capacity of the wealthy to supplement their endowments by gifts, as they have done in the past, has been greatly reduced by high taxes. As a result these schools have been forced to rely increasingly on higher prices for instruction (tuition as it is called in academic circles) to make both ends meet.

Since 1940, the independent colleges and universities have raised their tuition fees by an average of about 60 per cent. This is considerably less than the increase of about 100 per cent in prices generally since 1940. And it is nowhere near enough to prevent the faculty members of the independent colleges from faring miserably in terms of salaries, a matter of major national importance to which we shall return in this series. But the increase in tuition fees of the independent colleges has been much greater than the increase in the fees charged by the tax-supported schools. And that price differential increasingly tends to shunt students into the schools which are supported chiefly by taxes. Independent colleges now charge, on the average, about $580 per year for a full course of instruction while the tax-supported institutions charge, on the average, about $240.

Bigger Tax Bill in Prospect

A large increase in the total enrollment in our colleges and universities during the next decade is in prospect, particularly when the great increase in births during World War II is reflected in the number of young men and women of college age. With a total of 2.5 million students at present enrolled in our institutions of higher learning, it is estimated that the total will be over 3 million by 1960.

If this trend continues most of the anticipated increase in college and university enrollment will be concentrated in tax-supported institutions. Indeed, if the shift toward tax-supported institutions that has occurred in the last three years were to continue over the next six years at the same rate, about two million of the three million students anticipated in 1960 would be in tax-supported colleges and universities and one million in independent schools. In 1950 there was a 50-50 division in enrollment. This shift would mean, of course, a corresponding increase in the tax bill for tax-supported education. And of this bill, we can be sure that an ample share would be assessed against business firms.

No Easy Solution

The best way, of course, to put a brake on a soaring tax bill for higher education is to help the independent institutions get in shape financially to carry a larger share of the student load. For most companies the development of a mutually satisfactory program of financial aid for higher education is a complicated process. In fact, it is so complicated that some companies with an initial disposition to provide financial help are inclined to despair of working out a mutually constructive plan.

If, however, the leaders of business will contemplate seriously the only available alternative to their extending voluntary help to our independent colleges and universities, their determination to work out a plan will be strengthened. For that alternative involves a grave weakening of our system of higher education, together with an involuntary increase in the financial support of higher education by business. The increase would come through higher taxes. Contemplation of such an alternative should, if necessary, toughen the will of business firms generally to do everything possible to extend financial help to our independent colleges and universities.

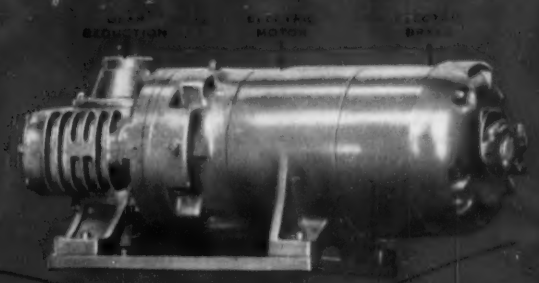
This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.

Donald C. McGraw

PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

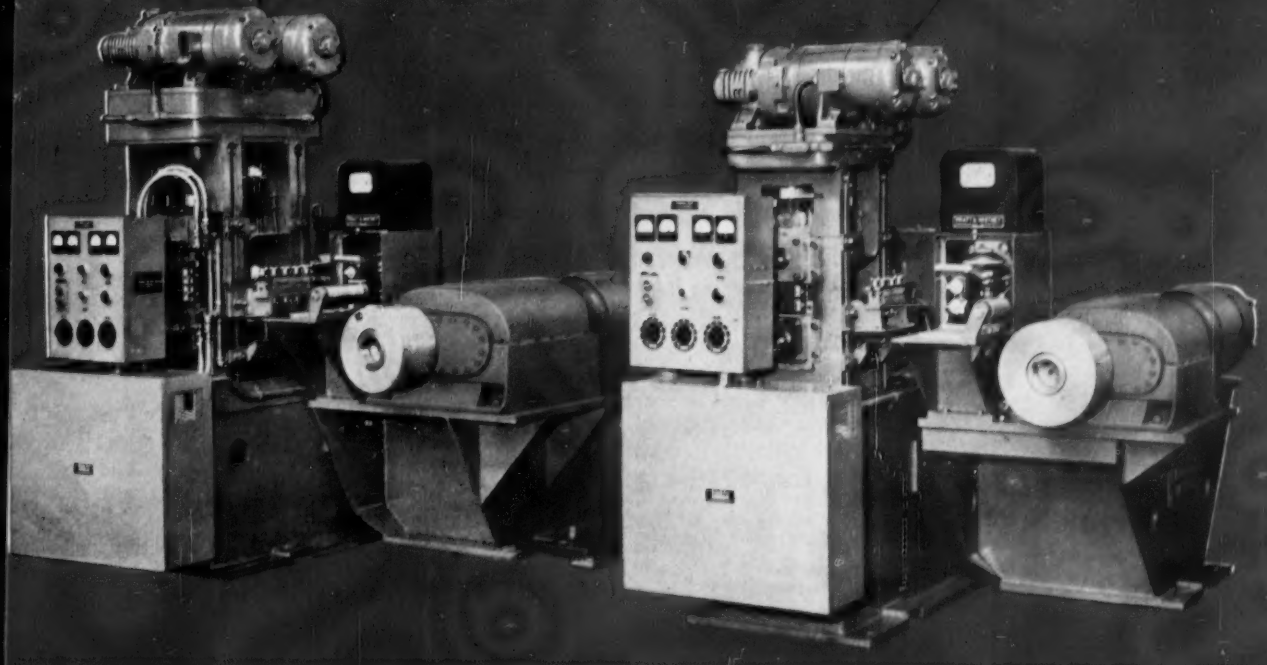


See how easily the standard electric motor, standard gear reduction, standard electric brake combine into a drive that gives the RIGHT horsepower, the RIGHT shaft speed, the RIGHT features . . . all in one compact unit. Nowhere else will you find power units that are so flexible, so easily adaptable, and in such a wide range of types and ratings.

Master power drives are available in thousands and thousands of ratings (⅛ to 400 HP) . . . in open, enclosed, splash proof, fan cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 430 to 1 ratio . . . with electric brakes . . . with fluid-drive . . . with mechanical or electronic variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best power drive for you.

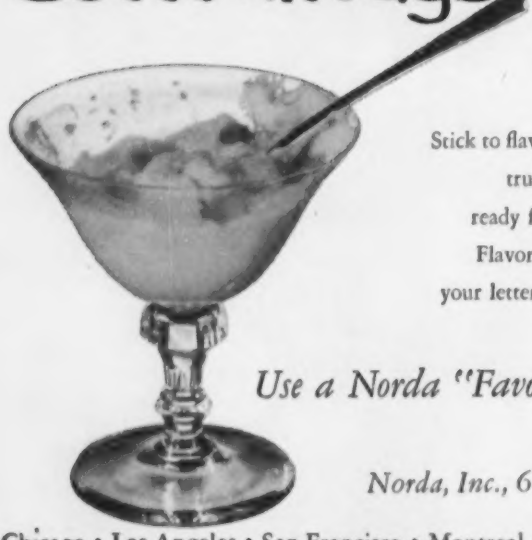
standard units easily combine into special purpose drives

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO



If you want good, profitable, steady trade Shun Butterscotch Flavor that will fade.

NORDA Flavors don't fade out, So... always come to NORDA



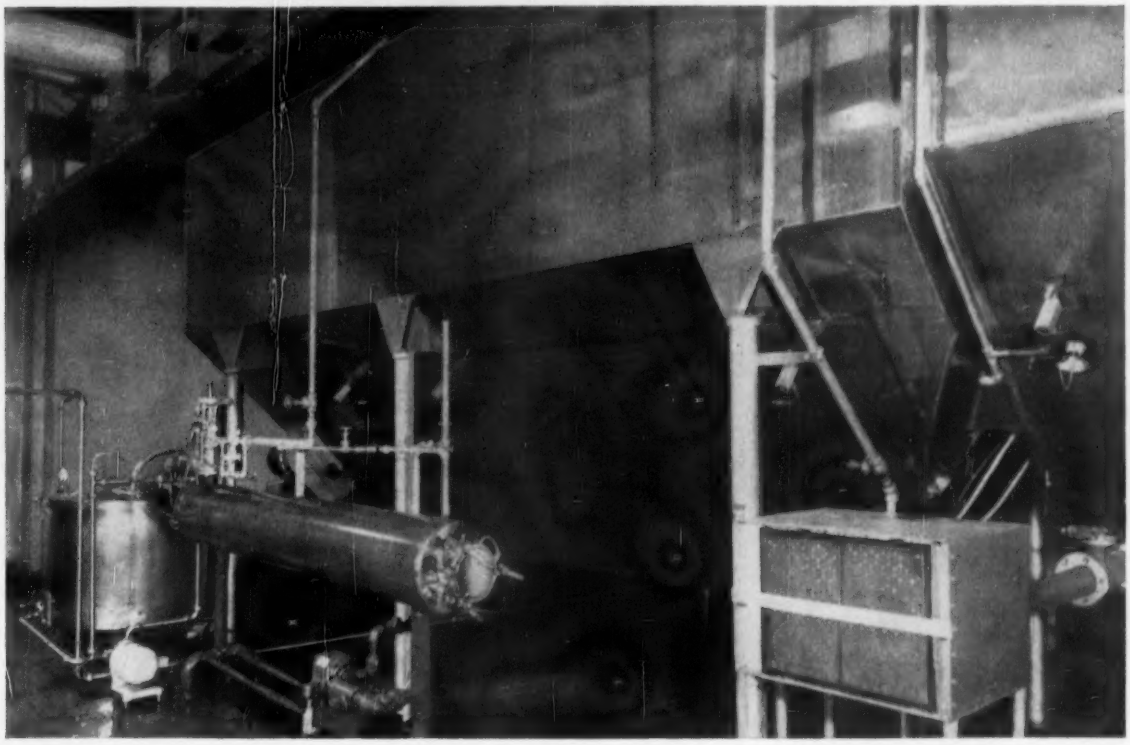
Stick to flavors that stick with you and stay true. Profits fade if flavors fade when your product is ready for eating. Genuine or fine imitation Norda Flavors *last*. Use Norda Flavors. See why, by sending your letterhead for *free samples*.

Use a Norda "Favorite to Flavor It" **Norda**

Norda, Inc., 601 West 26th Street, New York 1, N. Y.

Chicago • Los Angeles • San Francisco • Montreal • Toronto • Havana • London • Paris • Grasse • Mexico City

NEW EQUIPMENT & SUPPLIES



New Type Spray Dryer and Accessories Offered as Package Unit

Incorporating a unique operating principle, this new-type spray dryer is designed to meet increasing demands for high dispersability and ease of reconstitution in powdered milk and other food products. Thus, production of very large particles of uniform size is reported with this equipment.

Unit features "horizontal air suspension", a method of keeping powder suspended in air instead of allowing it to drop to the floor of the drying chamber. As each particle of spray is carried along the main air current, it puts moisture into the surrounding air on drying. Then, as heavier particles of powder fall toward the floor of the spray chamber, they are caught by a rising stream of fresh, unused warm air.

Therefore, powder remains suspended by the rising air from beneath until it is thoroughly dried.

After less than 7 sec. in the drying chamber, particles are collected in a high-efficiency stainless steel cyclone, which in actual tests on normal plant production showed 99.33 to 99.73% collection. Then an air conveying system carries the product through sanitary stainless steel tubes to any point in the plant. Cool, filtered dry air is used to convey the powder, which is cooled in transit and is ready for immediate packaging.

Drying chamber, inside and out, is constructed of heavy all-welded stainless steel sheets, and all welds are ground and polished. Unit is insulated with a 2-3 in. thickness of glass wool, and rests on adjustable legs.

Chamber's internal framework supports heating coils, intake fans, exhaust fans, air filters, hot air duct, and powder collector. A specially designed, electrically operated hoist raises the top of the collector to cleaning position and also lowers it to operating position. The highly polished multiple cyclone is continuous with the drying chamber.

Dryer, complete with all auxiliaries, is shipped as a unit. It may be operated with steam coils or direct gas fired. Also, dryer and evaporator can be had as a single package unit on a common platform. And if desired, it can be furnished complete with hot wells, concentrate heaters, and pumps.

Plant installation steps thus are reduced to a minimum.—*Henszey Co., Watertown, Wis.*

Circle 129A on Reader Service Card

Side-Seam Feature Improves Polyethylene Bags

A new welded side seam, reportedly possessing unusual strength and uniformity, now permits manufacture of seamless bottom polyethylene bags.

They provide full front and back surfaces for brand printing, uninterrupted by center seams. And unprinted areas offer complete, unmarred visibility of the product from the front, back or bottom of the bag, thus making it an ideal display package for numerous applications.

Known as Fine-Weld construction, it produces a thin, beaded seam that is termed actually stronger than the polyethylene film itself. In the process of forming this seam, polyethylene edges are heated to a point where they fuse and build up several times the thickness of the original film. This brings lateral seam strength to a maximum, in which case the film rup-

tures before the seam pulls apart. Only possible way to tear the seam is to shear the film along the seam itself, which is stress not normally encountered in packing and handling.

Thin welt of the new seam is small and even, while weld is not brittle but completely flexible. It completely eliminates unsightly "fins" that are characteristic of back seams and some conventional side seams. As a result, package is trim and neat.

Bags with this seam are easily handled on the packing line. There are no stuck tops, and bags can be made with an easy-opening lip feature that assures quick, positive performance.—*Bemis Bro. Bag Co., 408 Pine St., St. Louis, Mo.*

Circle 129B on Reader Service Card

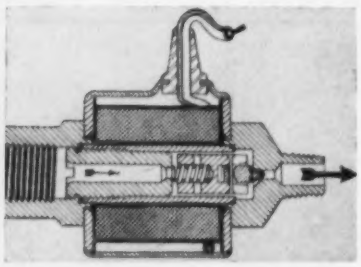
Ultra-Violet Unit Detects Invisible Contaminants

Offered as an aid in quality control is a new portable, high-intensity ultra-violet source, designed to detect adulteration and impurities in foods and containers. Present applications are in sorting, inspection, and analysis.

When directed at certain substances, invisible "black light" rays cause fluorescence, whereby these materials radiate a color different from their own. Thus many contaminating elements, invisible or nearly so in ordinary white light, stand out with clarity when exposed to ultra-violet. And differences in fluorescent coloring are almost a sure indication of variation in composition, source, or history of any two or more materials.

New unit consists of a Model SL Mineralight, available in long wave (Model SL 3660) or short wave (Model SL 2537) for a.c. operation, and a 6v. adapter for use with a portable battery or other 6 v. source.—*Ultra-Violet Products, Inc., So. Pasadena, Calif.*

Circle 130A on Reader Service Card



High-Pressure Solenoid Valve Is Small, Compact

Designed to meet present day demands for space conservation and low-power consumption, this high-pressure solenoid valve is proclaimed the most compact of its type. Its length is 2⅜ in., dia. 1⅜ in., and weighs only 5 oz.

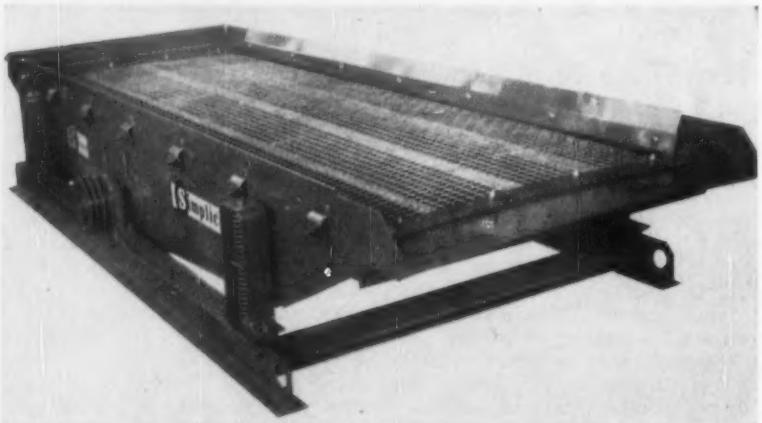
Advantages cited for this valve are: Straight-through flow, fast operation (over 1,000 cycles per min.), low temperature rise, leakproof up to 200 lb. pressure, operation in any position, and quick, easy mounting without brackets.

No gaskets are used in the valve's construction which is of stainless steel for important components, while all parts are silver-brazed for rigidity. In addition, a self-aligning synthetic rubber needle valve gives positive close-off at any pressure.

Models are available in 6, 12, and 24v. d.c., and 110/220v. a.c. Units are completely waterproof and may be used in the temperature range from −65 to +350 deg. F.

Orifice sizes range from 1/16 to 5/16 in. dia., while inlet connection is ¼ in. NPT and outlet ⅛ in. NPT.—*Specialty Products Co., 3725 Monitor Ave., Minneapolis 16.*

Circle 130B on Reader Service Card



Efficient Screen Has High Separating Capacity

For applications such as sizing and dewatering, this light, compact gyrating screen offers a full 24 sq. ft. of screening surface.

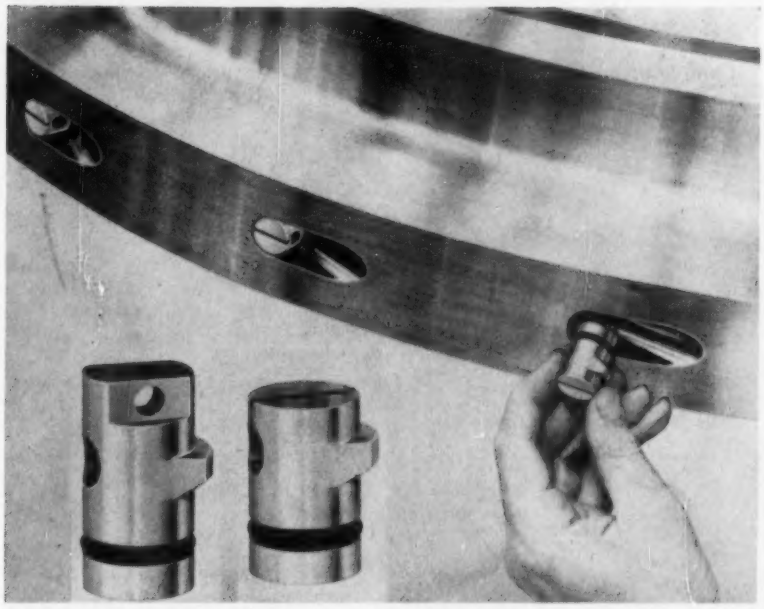
Known as model "C", its completely balanced assembly is said to concentrate vibration in the deck area, while little is transmitted to the main frame, support structure, or plant floor.

Unit is tapered at the discharge end to fit existing conveyors, and is available with stainless steel screen cloth, or mild steel deck and spring steel cloth. Screen is provided with tension on all four sides. This permits use of lighter wire cloth, thus giving more open area. And all welded parts are normalized to relieve stress.

When handling hamburger pickles, for example, 100 bu. per hr. are fed to the unit. Screen cloth opening used in this application is ⅛ in. square by 0.120 stainless steel wire.

Screen measures 3 ft. by 8 ft., while unit weighs 1,000 lb. and is of mild steel construction.—*Simplicity Engineering Co., Durand, Mich.*

Circle 130C on Reader Service Card



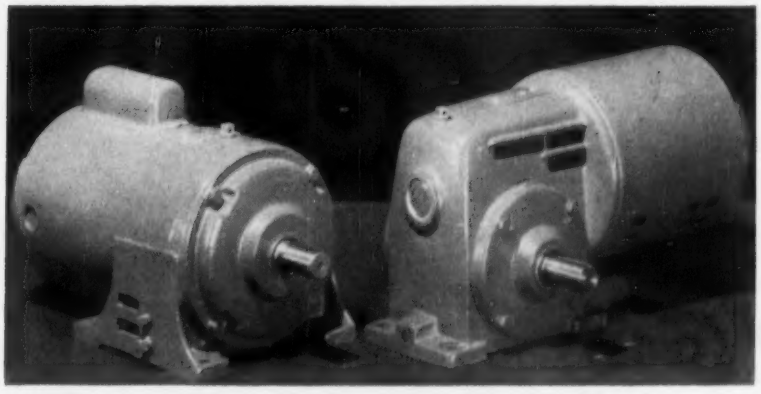
Easy Removal Marks New Centrifuge Nozzles

Two types of camlock nozzles for centrifugal separators, flush- and extended-head units, incorporate a hydraulic-flow principle that reportedly provides a more streamlined slurry flow. In addition, this design is said to permit maximum speed and ease of replacement. Furthermore, these nozzles may be used with all standard model centrifugal separators.

Either nozzle is recessed in the rotor bowl to allow free discharge of the jet at a fixed angle. And an added feature is the conventional "O" ring to provide a positive seal in the port. This eliminates internal positioning or cementing the nozzle in place, which accounts for the speed of its removal.

Extended-head model is designed for use wherever process liquors are apt to set. It is easily removed with a short-length of steel rod or a standard drift pin which the manufacturer supplies. The flush-head nozzle, however, requires use of two screwdrivers for removal.—*Merco Centrifugal Co., 150 Green St., San Francisco 11.*

Circle 131A on Reader Service Card



New Gear Motors Are Externally Reconnectable

These fractional-horsepower gear motors, for applications such as pumps, conveyors, and machine tools, reportedly offer maximum torque transmission, uniform speed, and no slippage. To achieve this, the driving motor is close-coupled and positively geared to the output shaft.

Included in the maker's Form G line are right-angle and concentric-shaft motor types, which are smaller and 10% lighter than previous designs. Units are reconnectable externally to reverse the direction of shaft rotation, and large bearings with high thrust capacity are locked to carry motor shaft thrust in either direction.

Gears are accurately matched and have large tooth sections for long life and quiet operation. On the concentric-shaft unit, helical planet gears mesh with an integral ring gear to absorb shock loads. And a solidly-fixed worm gear on the right-angle shaft motor assures full rated output with no uneven speeds.

Concentric shaft motors are available in ratings of ¼, ½, ¾, and 1 hp., from 13.5 to 520 rpm., 115/230v. single-phase and 220/440v. three-phase. And right-angle shaft motors are offered in the same ratings with speeds from 24 to 148 rpm.—*General Electric Co., Schenectady 5, N. Y.*

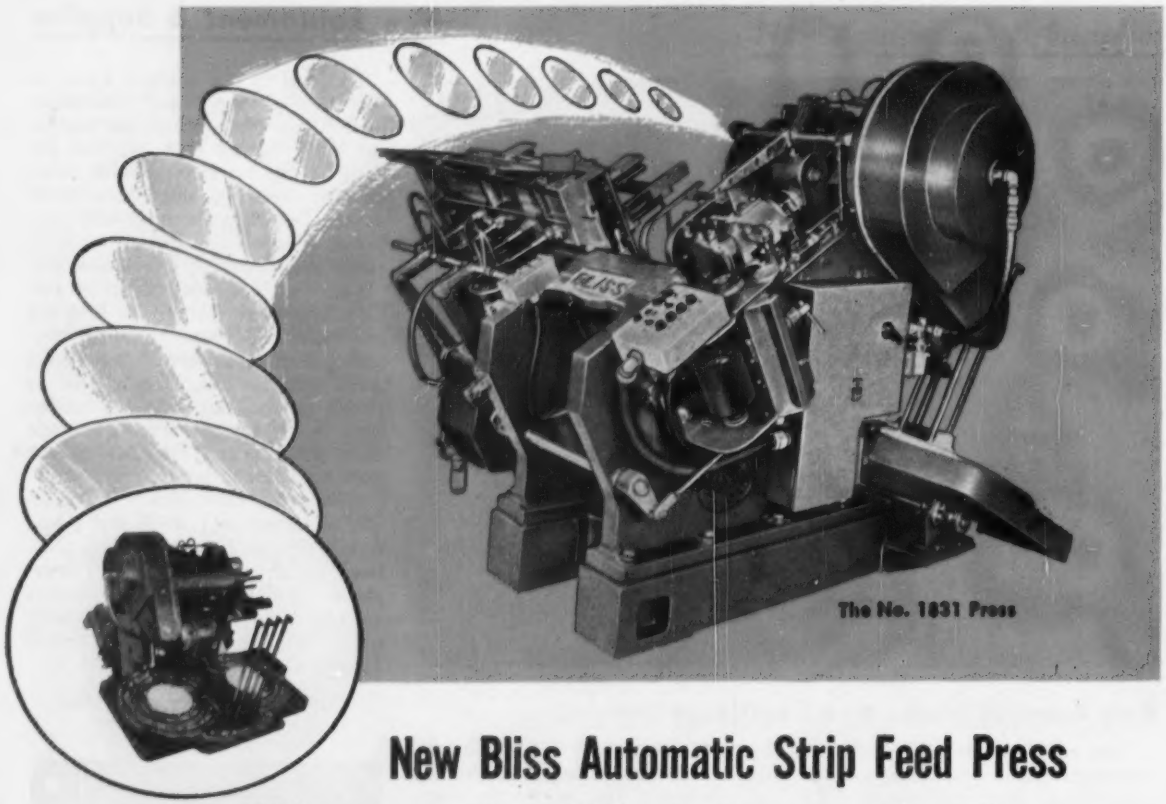
Circle 131B on Reader Service Card

Numerous Advantages Features Paper Pallet

Here's a new and unique industrial pallet for the handling and shipping of bagged and even packaged commodities. Extensive tests have demonstrated that new pallet offers a number of important time and money-saving advantages.

Known as Accopak Pallet, it consists of a treated paper sling fitted with paper tubes. New type bayonet forks, readily attachable to any present type of fork-lift truck, slip into tubes, enabling palletized load to be lifted, carried and stacked in single, double or triple-deck tiers without removal of pallet during storage or shipment.

One of important advantages offered by new pallet is in connection with



New Bliss Automatic Strip Feed Press will deliver more than 300 strokes per minute!

From the ground up, it's been engineered to slash maintenance needs and boost production speeds

You wanted speed in your strip feed presses—reliable speed! And here it is: to 300 strokes per minute (or more, depending upon can size), more than 18,000 strokes per hour all day long—without time-wasting stoppages for re-adjustment and repair.

One of the major features of the new Bliss press is its precision counter-balanced crank-shaft and feed bar crank which holds vibration to an almost irreducible minimum and thereby permits smooth, quiet operation at high speed.

Other features: combination disc friction clutch and brake—permits instant starting • feed bar is driven by crank instead of lever—and has adjustable fingers • a bigger bolster plate • no idle strokes between strips, if desired • slide stops instantly at top of stroke.

You'll want to know more about these developments. For complete details, write, wire or phone

E. W. BLISS COMPANY
50 Church St., New York 7, N. Y.

BLISS
SINCE 1857

is more than a name...*it's a guarantee*

BLISS CAN AND CONTAINER MAKING MACHINERY

SLITTERS

BODYMAKERS

FLANGERS

SEAMERS

TESTERS

STRIP FEED PRESSES

loading and unloading freight cars or motor trucks. Pallet sling is no thicker than heavy wrapping paper and entire pallet weighs less than 3 lb. An entire load can be shipped double-decker and completely palletized without use of wooden pallets, and can be unloaded and warehoused as a completely palletized shipment.

Tests have indicated a saving of from 8 to 10 man hr. in unloading a completely palletized shipment as compared to handling by non-unitized methods. One man with a fork-lift truck, and without aid of a helper, can unload and stack in warehouse in approximately one-fifth of time previously required with non-unitized bagging. Since bags are shipped completely palletized, they arrive in more compact shape, stack more neatly, and take less space.

In warehouse storage, special stacking on wooden pallets is not necessary with new pallets. They can be stacked in multiple-deck fashion without removal of pallet.

Pallets can be easily stored and assembled. They can be rolled up like a map or stored flat, with tubes tied in a convenient size bundle. Pallet can be assembled in a few seconds simply by inserting the tubes in the ends of the sling.—*American Cyanamid Co., 30 Rockefeller Plaza, New York City.*

Circle 131C on Reader Service Card

Pivoted Wheel Mounting Marks New Hand Truck

Designed to handle both barrels and drums, this hand truck's unique feature is pivoted mounting of the wheels. This aims to permit operator to pick up and "break over" a drum without lifting either truck or drum off the floor. Here's how it works:

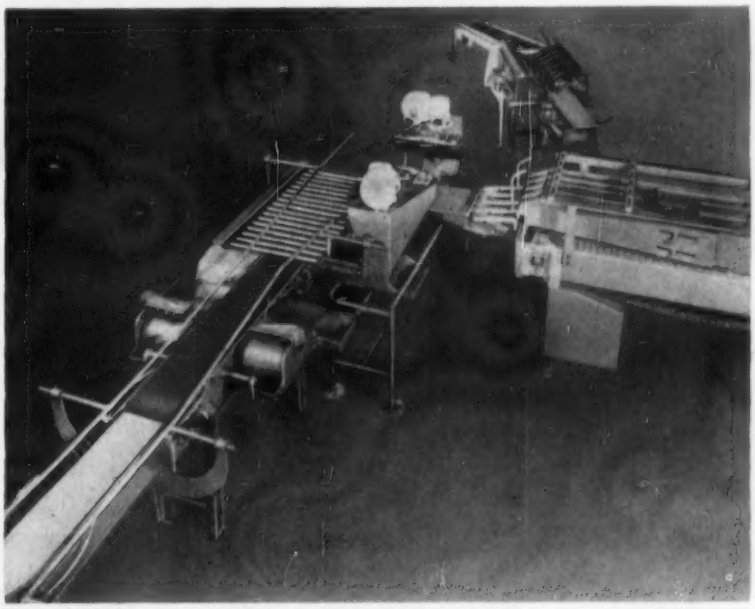
Operator pushes truck up against a drum and engages an adjustable hook on top lip of drum. He then steps on a foot pedal which allows wheels to become free-wheeling and to move in a backward direction. As drum is broken over, prongs slide under it and both truck and drum pivot until drum is in the proper carrying position.

Weight of the drum is eliminated from the effort required to break over the truck. And when latter is raised vertically, wheels automatically lock in the forward position. When not in use, truck stands in a vertical position.

This versatile unit, only 23-in. wide, can handle drums or barrels of 20 to 36 in. diameter, weighing up to 600 lb.

Truck is arc-welded into a one-piece frame with tubular steel support members, and weighs only 65 lb. It has 10-in. dia. roller bearing wheels which are available in steel, rubber or celeron to meet individual operating conditions.—*Lewis-Shepard Prod., Inc., Watertown, Mass.*

Circle 133A on Reader Service Card



Casing Unit Combines, Simplifies Bottling Operations

Reduction in labor cost, floor space, and glass breakage are advantages reported for a new case handling system. It is designed to combine and simplify operations on both fast and moderate automatic bottling lines.

Key to system is an integrated case-over-bottles caser, uncaser, and sealer unit, that makes light work for the operator and permits fast changeover and less maintenance. Cases and bottles while in cases, are upright at all times. As a result, tops of cases rather than bottoms are sealed at the glass plant. In operation, cartons of empty glass are conveyed to a bottom-flap opener, which is activated when operator slides a case to the unscrambler and lifts case from bottles. While this carton is still in her hand, she turns and places it over a case load of filled bottles, which were previously uncased by her.

Bottles are filled, labeled, and capped by regular automatic equipment. Then they are returned to the operator. The caser at her side groups bottles into case load patterns and releases them when case is applied. Thereafter, inexpensive equipment glues and closes bottom flaps as case gently rides along conveyors. And weight of the filled containers acts as a compression unit to seal the glue on the case flaps.

In this process, one operator can uncase and recase as many as 13½ cases per min. Furthermore, if the line does not run over five or six cases per min., cases may be returned directly for stacking to the operator who feeds cases to the line.

Since bottles are upright in the top-sealed case at all times, most of the bottle separators in the case may be shortened in height to the tops of

see us if you can

IF YOU ARE A CANNER—come to the Canners' Show! 150 exhibitors will show you the latest canning equipment and supplies, at the Conrad Hilton Hotel, Chicago, February 19-23.

And, while you're on the Grand Ballroom floor, drop in at Booth 223. That's us. Bring a brick-bat or a bouquet—or a bright idea. Or just sit down and rest. (We'll even sell you a subscription, if you insist.)

see us if you can't

IF YOU CAN'T ATTEND the Canners' Show, be sure to watch for FOOD ENGINEERING'S April issue—for a full report on the new equipment and supplies exhibited at the show. This way, you'll be able to take in the show even if you can't attend! And, by using the Reader Service postcard in the April issue, you'll be able to get more information quickly on anything that strikes your fancy in FOOD ENGINEERING'S "Show in Print."

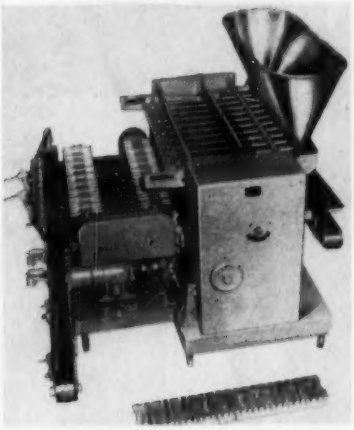
Of course, *every* issue of FE is a "Show in Print"—and the Reader Service postcard is a handy way to inquire when you see something new. (It's just inside the back cover.)

First with the men who ***run*** the plants that ***lead*** the food industry

the bottle shoulders. Thus, states the maker of this equipment, savings in separator costs alone may pay for the system within the first year of operation. And these machines are made of easily available parts.

This process is limited, however, to use of single tier RSC or AFM cases of bottles or cans. And further, it may be used only on lines with automatic bottling equipment.—*Container Handling, Inc., Terminal Annex, Los Angeles 54.*

Circle 133B on Reader Service Card



Fills Viscous Products At Higher Speeds

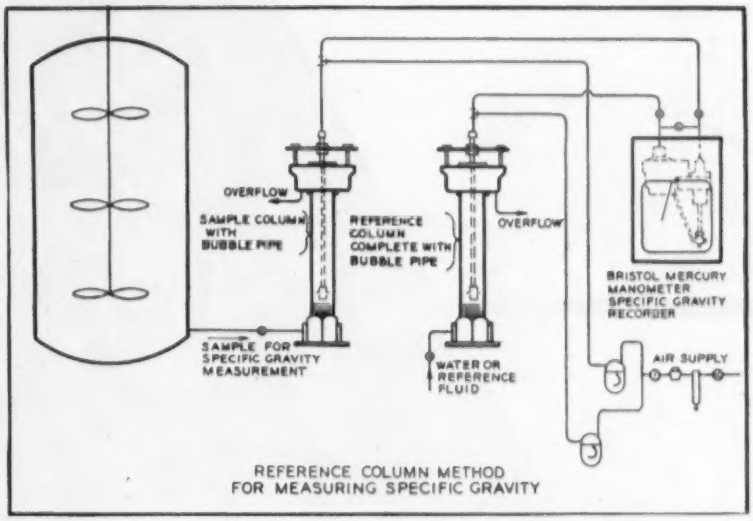
Of interest to processors of mayonnaise, peanut butter, preserves, or other viscous foods, is a new heavy-duty piston-type filling machine. Designated as Type 41, it is offered in 6, 8, and 10-line sizes to meet the current trend to higher speeds, up to 250 per min., in viscous product filling.

Additional features: Adjustable filling-head height, micrometer-type quantity adjustment, no container-no fill arrangement, adjustable rising-table lift, variable speed, and ball bearing units on all shafts in a fabricated steel frame.

And as optional equipment, a double-turnover container cleaner is built integral with the filling unit. This device airblasts and vacuums. A grill, shown in the foreground, replaces the first turnover pockets when feeding tapered glass inverted to prevent arching.

Also available are an assortment of accessories, such as agitators, oil or water jackets, and special nozzles for dripless, non-spill operations.—*Hope Machine Co., 9400 State Road, Philadelphia 14.*

Circle 135A on Reader Service Card



REFERENCE COLUMN METHOD FOR MEASURING SPECIFIC GRAVITY

New Metering System Controls Specific Gravity

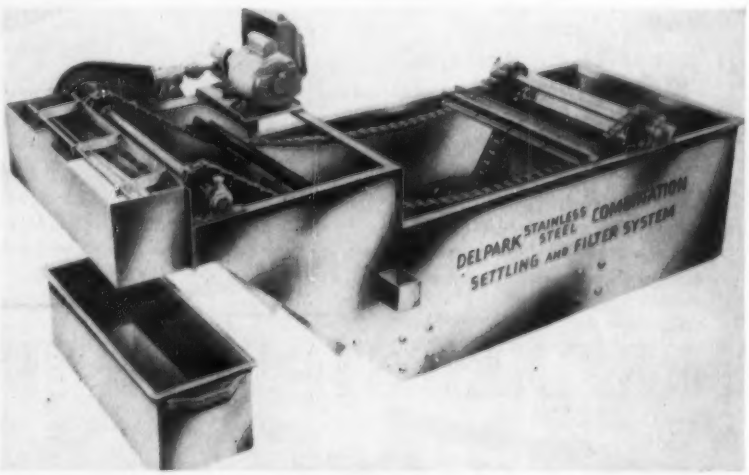
Automatic measuring and control of the density of liquids is offered by a recent line of specific gravity meters.

Units operate by comparing the pressure required to displace a given head of sample liquid in a bubbler pipe, with that necessary to displace an equivalent head of water. Instruments used for this purpose can be calibrated directly in terms of specific gravity, Twaddell units, deg. Baumé, or other appropriate units. Furthermore, they may be used for any liquid which can take a bubbler pipe.

Meter, which is factory-calibrated for the liquid question, has a mercury body with or without counterpoise. It operates with a standard Series 500 recorder, which can be equipped to provide automatic control in any of five ways.

And as a separate item for radiation-type density measuring unit, an electronic Dynamaster recorder and controller is available. It is used in closed system measurements, such as pipes, tanks or processing equipment. —*The Bristol Co., Waterbury 20, Conn.*

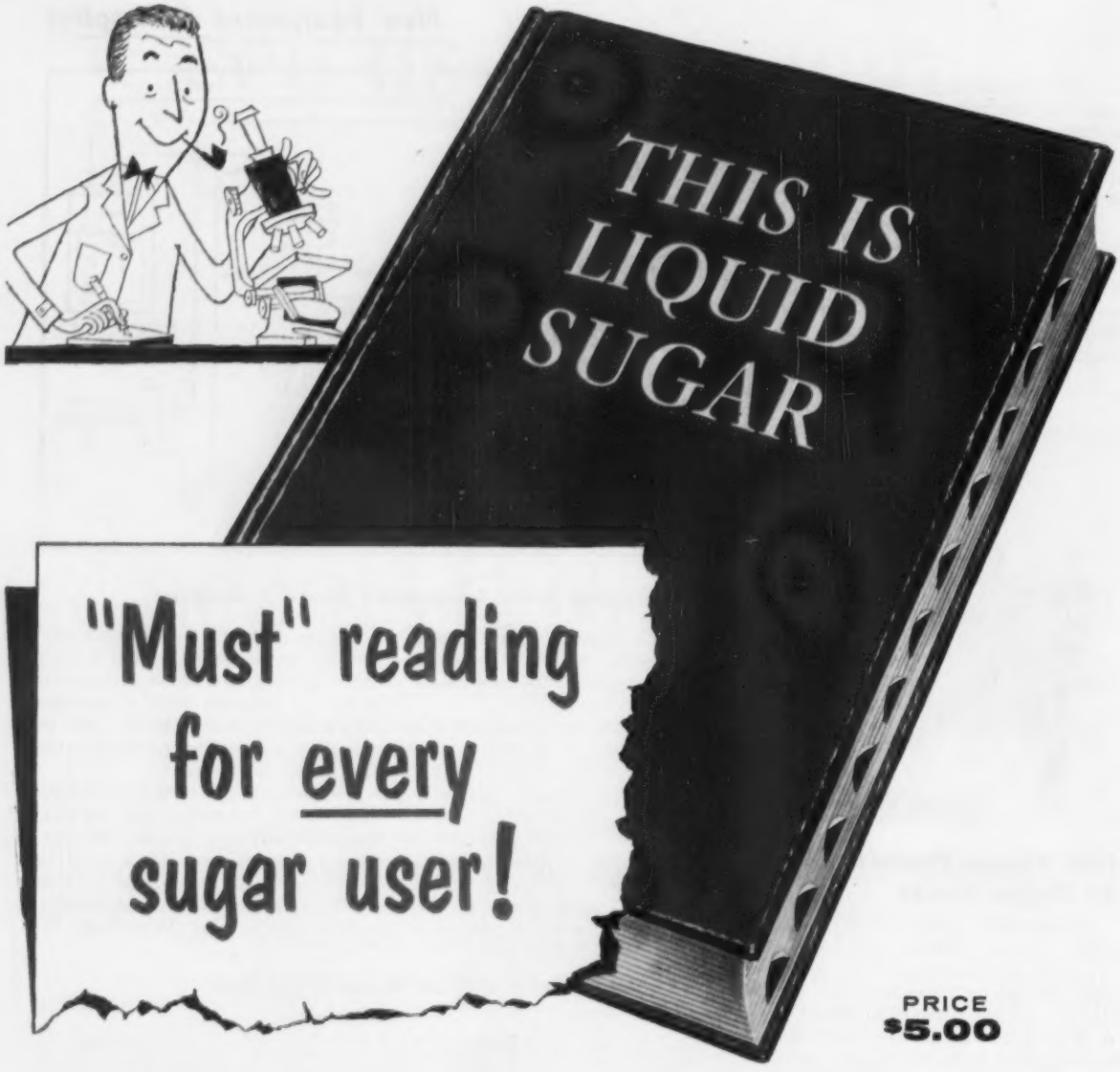
Circle 135B on Reader Service Card



Stainless Filter System Eliminates Metal Pick-Up

Filtration of edible oils, juices, and other metal-sensitive liquids are applications seen for this stainless steel settling and filter system, designated at Delpark.

Designed for filtration of particles



"Must" reading for every sugar user!

PRICE
$5.00

"Here it is," announces your Flo-Sweet Engineer — "the first compilation of liquid sugar facts and figures to be made available to the food industries!

"This new liquid sugar manual contains technical data amassed throughout years of research by Flo-Sweet technologists. Much of it has never been published before.

"Here are some of the important subjects this valuable reference work covers: history, production, and distribution of liquid sugar; liquid sugar systems; techniques of using liquid sugar in major food industries and dozens of pages of charts, graphs and tables covering every aspect of liquid sugar use."

You can arrange with your Flo-Sweet Engineer for your copy of "This Is Liquid Sugar" — or you can obtain the book direct from Refined Syrups & Sugars, Yonkers, N. Y. Price $5.00.

REFINED SYRUPS & SUGARS, Inc.

YONKERS, NEW YORK

FLO-SWEET
FIRST IN LIQUID SUGAR

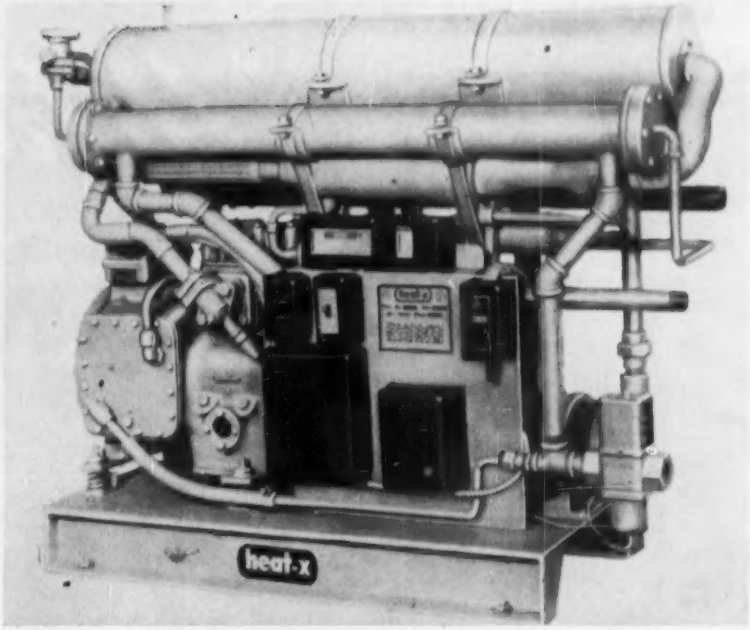
SERVING INDUSTRIAL SUGAR USERS EXCLUSIVELY
FROM YONKERS—PITTSBURGH—TOLEDO—DETROIT

0.004 in. or larger, unit employs a settling basin for preliminary removal of particles of varying weights. Then filtration is through special bar stock screens.

In operation, chain driven flights of solid and brush construction pass down the filter screen removing filtered solids, then across the floor of the settling area gathering additional sediment. Solids are thus carried up a ramp at the end opposite the filter. Flights are automatically cleaned and returned to the screens to repeat the cycle, while solids fall into a tote box.

Screen slots are accurately sized, and may be easily removed for cleaning. This is done by sliding a solid metal plate into position back of the screen to prevent unfiltered particles from passing back into the system. Then, screens are removed by lifting up and sliding them out of the channels in which they rest.—*Industrial Filtration Co., Lebanon, Ind.*

Circle 135C on Reader Service Card



Package Chillers Feature High Capacity, Less Bulk

Offered for chilled water air conditioning systems, and beverage and industrial water cooling applications is a new line of package chillers, called "PC".

Condensers, chillers, and heat exchangers are of inner-fin construction, thus permitting greater capacity with less bulk. Circulating pumps, of the non-overloading type, have mechanical seals to eliminate danger of leaks. Hermetic compressors are standard.

Units are available in ratings from 2-15 hp., completely wired, charged with Freon, requiring only power and water connections for operation. On the 10 and 15-hp. models, two separate refrigeration systems with thermostatic controls in the water return lines to the chillers, permit operation at 50% capacity when required.—*Heat-X-Changer Co., Brewster, N. Y.*

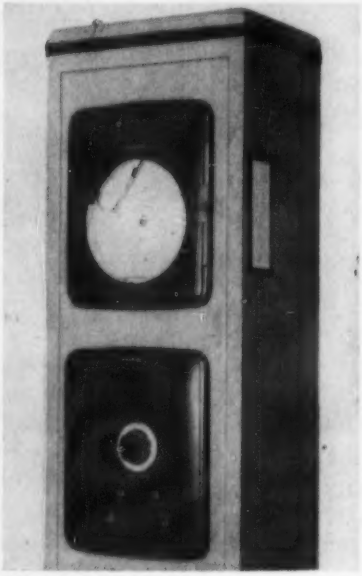
Circle 137B on Reader Service Card

Torque-Flow Solids Pump Handles Fragile Items

No damage to delicate items, such as cherries and tomatoes, is reported with use of this torque-flow solids pump. It is designed for low-cost operation and features a recessed impeller and projection-free interior. This prevents clogging and reduces wear in the unit.

Actual pumping is done with a vortex or swirl, produced by the rotating impeller. Similar to an automobile fluid drive, this swirl continuously sucks in material and expels it by centrifugal action.—*Western Machinery Co., 760 Folsom St., San Francisco.*

Circle 137A on Reader Service Card



Temperatures of Rooms Logged Electronically

Storage and production room temperatures may be kept within safe limits with use of this cabinet-enclosed automatic electronic temperature-scanning system. Thus time-consuming, twice-a-day thermometer checks are eliminated.

Key to system is a segmental chart dynalog recorder that centralizes and simplifies temperature readings by "making the rounds" continuously. Located in the boiler room, it is connected by ordinary electric wiring to sensitive temperature bulbs in critical plant areas.

This instrument logs 24 room temperatures in succession, making a complete plant check every 25 min. When a special reading is desired, boiler room operator can interrupt the sequence, dial the room in question and

"Ne Plus Ultra"

OF PROCESS CONTROL

THE *Ultravalve*

Incorporating all the features of special Hammel-Dahl valves used on the most dangerous applications . . .

Now the STANDARD 1000 SERIES of the H-D control valve line.

COMPLETE Information in Bulletin 103-B

HAMMEL-DAHL COMPANY

175 POST ROAD, (WARWICK) PROVIDENCE 5, R. I., U. S. A.

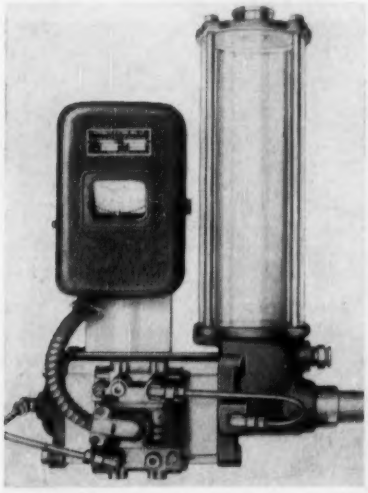
SALES OFFICES IN ALL PRINCIPAL CITIES

MANUFACTURING PLANTS IN WARWICK, R. I., U. S. A., CANADA, ENGLAND, FRANCE AND HOLLAND

CANADIAN MANUFACTURING AFFILIATE—GUELPH ENGINEERING CO., GUELPH, ONT.

flip a switch for instantaneous measurements. Then, guided by the readings, he regulates individual room temperatures as required.—*Foxboro Co., Foxboro, Mass.*

Circle 137C on Reader Service Card



Central Lubing System Has 3-Way Control

Automatic lubrication of bearings at predetermined intervals is provided by a new air-operated centralized lubrication system. Unit is designed for servicing machines operating at varying rates of speed. And when applied to automated machine lines, it permits interchangeability of machine parts without disturbing the lube system.

System consists of an air-operated, single-stroke pump requiring air for both forward and return strokes. A cast iron pump body houses a precision-fitted nitralloy steel bushing and plunger that eliminates by-passing, and has no washers or packings to replace. Pump body also serves as a convenient bracket for mounting pump assembly on machine.

Unit's brass air cylinder provides a highly polished surface for travel of the free-floating, oil-resistant piston. This assures positive air seal and efficient operation, even at extremely low pressures. And no oiling is required.

Lubricant reservoir incorporates a clear plastic container and removable strainer. Air cylinder and lubricant reservoir are rigidly secured by tie rods bolted to cast iron caps and pump body. Pump may be easily refilled by contacting buttonhead fitting in pump body, or through oil cover at top of reservoir, and requires a four-way air valve component for operation.

Lubrication control may be by any one of three methods: (1) Mechanical control—machine's motion actuates the air valve which in turn cycles the lubrication system; (2) electrical control—adjustable time clock actuates a solenoid air valve which in turn cycles the lubrication system at intervals of 7½ min. to 3 hr.; and (3) manual control—air valve actuated at machine operator's discretion.

System includes an automatic safety control which stops the machine if air supply to pump fails, lubricant reservoir is empty, or lubricant supply line is damaged.—*Lincoln Engineering Co., Natural Bridge Ave., St. Louis 20, Mo.*

Circle 139A on Reader Service Card

Mobile Workbench Eases Machining Operations

Drills, saws, shears, grinders, punches and many other machine tools of "bench" size may be mounted on this elevated platform truck. Unit is designed to speed up work flow and save time, labor, and employee fatigue.

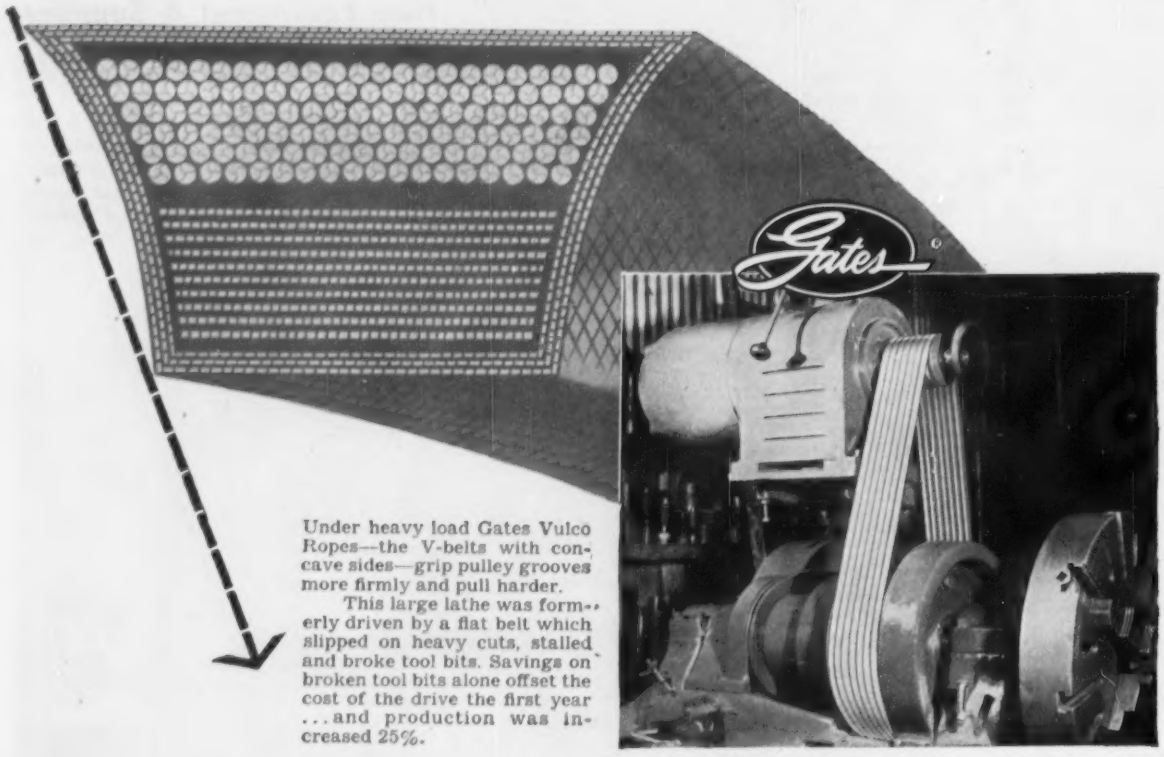
Parts and fabricated structures requiring machining operations are thus kept mobile and at comfortable "work height" level. And mobility permits use of one unit in various parts of production lines or in other departments.

In photo above, swivel mounts for the drill post assembly are standard platform truck axle boxes.

Trucks are available in any required height and size. Running gears consist of four ball bearing swivel casters for easy motion in any direction, or of two casters on one end with axle-mounted main wheels opposite.

Wheels combine a range of sizes. Included are roller bearing, demountable rubber tired, or semi-steel.—*Nutting Truck & Caster Co., Fairbault, Minn.*

Circle 139B on Reader Service Card



Under heavy load Gates Vulco Ropes—the V-belts with concave sides—grip pulley grooves more firmly and pull harder.

This large lathe was formerly driven by a flat belt which slipped on heavy cuts, stalled and broke tool bits. Savings on broken tool bits alone offset the cost of the drive the first year ...and production was increased 25%.

Concave sides keep belt costs down!

Industry is saving thousands and thousands of dollars every year by specifying Gates Vulco Ropes—the V-Belts with *concave sides* (U.S. Pat. No. 1813698).

Here's the interesting reason *why* Gates belts save money:

On the bend around the sheave the *precisely engineered* concave sides (Fig. 1) of the Gates belt fill out and become straight (Fig. 1-A). Thus the belt makes uniform contact with the sides of the pulley. That means sure pulling power and *even distribution of wear*. Longer wear, fewer replacements cut belt costs...reduce down time...contribute to profits.

Simple test proves value of concave sides

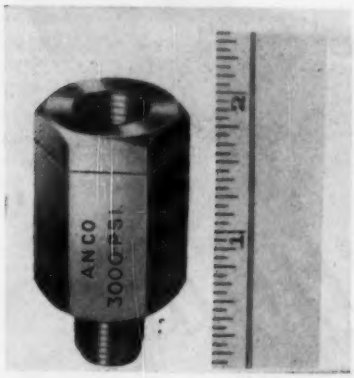
Bend a straight-sided belt (Fig. 2) and feel the sides *bulge out* around the bend. The bulging sides prevent the belt from fitting evenly in the pulley groove (Fig. 2-A). Uneven contact causes uneven wear...shortens belt life...increases costs.

Keep belt costs *down* by specifying Gates Vulco Rope Drives—the V-Belt with *concave sides*. Belts you need are readily available from nearby distributor stocks. The Gates Rubber Company, Denver, Colorado—*World's Largest Maker of V-Belts.*

Gates Engineering Offices and Distributor Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.

VPA 28-A

GATES VULCO ROPE DRIVES



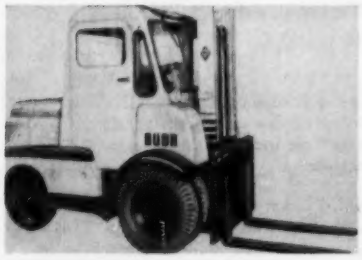
Pressure Gages Protected By New Valve-Type Unit

Most pressure gage failures, due to shock and wide pressure fluctuations are said to be eliminated with use of the new gage protector valve called Anco. Maker states that the unit also assures more accurate gage readings by preventing shimmy.

Small, compact, and low in cost, protector can be used for either liquids or gases. It is easy to install and has no moving parts to get out of order. Unit is available in steel (0-5,000 psi.), brass (0-3,000 psi.), or stainless steel (0-5,000 psi.) in sizes ¼ and ½ in. NPT. Female threads are used on the gage side, male threads on the pressure side of the line.

Finally, this device does not become permanently plugged by impurities, since it can readily be cleaned and restored to normal service.—*Anco Div., American Assoc., Inc., 1 Baker St., Providence 5, R. I.*

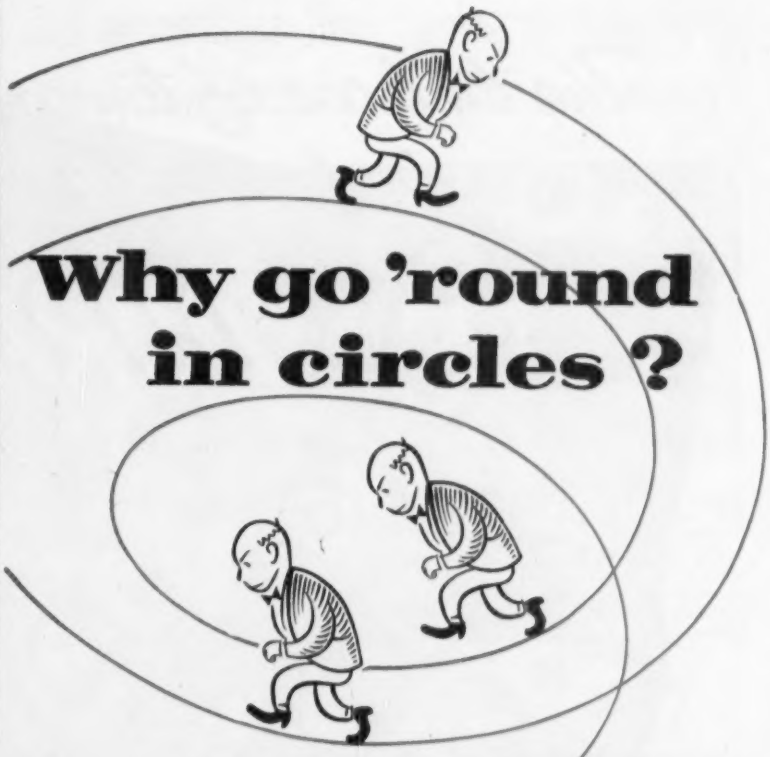
Circle 141A on Reader Service Card



"All Weather" Cab

Efficient and economical year round material handling, regardless of weather conditions, is seen with use of this new cab. Unit is for Models FTP60-24 (gasoline powered) and FTPD60-24 (diesel powered) pneumatic-tired, 600-lb. capacity fork trucks.

It features: Full driver visability;



Why go 'round in circles?

If a PACKAGING PROBLEM

has you stumped, look to PACKAGE for the answer

A phone call to our nearest office will put you in touch with an organization that has solved some of the most difficult packaging problems on record.

We designed the first wrapping machines that could handle cellophane and other similar materials . . . Pioneered in the development of quickly-adjustable machines that package goods in many different sizes . . . Perfected machines that incorporate an easy-opening tape in the wrap . . . Produced the machines that wrap chewing gum at the phenomenal speed of 600 sticks a minute . . . Gave candy manufacturers machines that enclose irregular-shaped bars in smooth, box-like wraps.

In many plants the *entire* packaging operation is handled by our machines – from carton formers that make the cartons from low-cost die-cut blanks, to the machines that wrap the cartons individually and bundle them in dozen or half-dozen lots.

The knowledge and inventive skill we can bring to bear on your packaging problems may prove invaluable—as has been the case in so many other instances. Get in touch with our nearest office.

PACKAGE MACHINERY COMPANY

Write for literature on our machines

NEW YORK PHILADELPHIA BOSTON CLEVELAND CHICAGO MINNEAPOLIS ATLANTA
DALLAS DENVER LOS ANGELES SAN FRANCISCO SEATTLE TORONTO MEXICO, D.F.

The tank car of tomorrow . . .
in production today!

acf BUILT DURADOME

Pressure tank car with new all-welded insulation jacket . . . new flued dome nozzle . . . new standardized underframe. One of many types of DURADOME tank cars.

Whatever your shipping requirements are you'll find a DURADOME tank car for your purpose. All DURADOME cars, regardless of type, use, or capacity combine *four advanced features* which make this the most revolutionary development in the tank car industry in the past 15 years!

✓ A million-dollar press actually *flues* the dome base out of the heavy center section—providing greater strength and safety . . . smooth interior surface.

✓ Superior pressure-type construction (complete ring sections) means heavier steel *all* the way around for greater durability and protection for costly ladings.

✓ Standardized all-welded underframe provides flexibility of use with tanks of all standard types and capacities . . . more economical maintenance.

✓ All-welded jacket for insulated cars—of heavier guage steel, with one-piece ellipsoidal head. Streamlined . . . more weatherproof . . . needs less maintenance.

DURADOME tank cars are available in all standard types and capacities . . . for sale or lease through . . .

SHIPPERS S H P X CAR LINE

SHIPPERS' CAR LINE CORPORATION

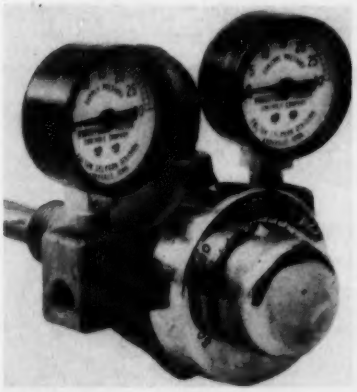
30 Church Street, New York 7, N. Y.

A subsidiary of acf INDUSTRIES Incorporated

CHICAGO, ILL. • HOUSTON, TEX. • SAN FRANCISCO, CAL. • MILTON, PA. • EAST ST. LOUIS, ILL. • SMACKOVER, ARK. • TULSA, OKLA. • NORTH KANSAS CITY, MO.

safety glass; adjustable door windows; entry from either side of cab; positive-action electric windshield wipers; and tinted plexiglass overhead window. Heater and defrosters are available as optional equipment.—*Buda Co., Division of Allis-Chalmers Mfg. Co., Harvey, Ill.*

Circle 141B on Reader Service Card



Thermostatic Control Has Rapid Response

A new pilot thermostat, unusually small and rugged in construction, is designed to provide accurate temperature control of liquids or air when used in conjunction with valves, dampers, and other controls.

Known as the Fultrol Pilot, it is readily used in process control systems and other applications in which rapid response and adjustable control characteristics are required. Control ranges are wide, from 50-250 F. and 150-350 F. And accurate, easily read gages indicate both pilot supply and control pressures.

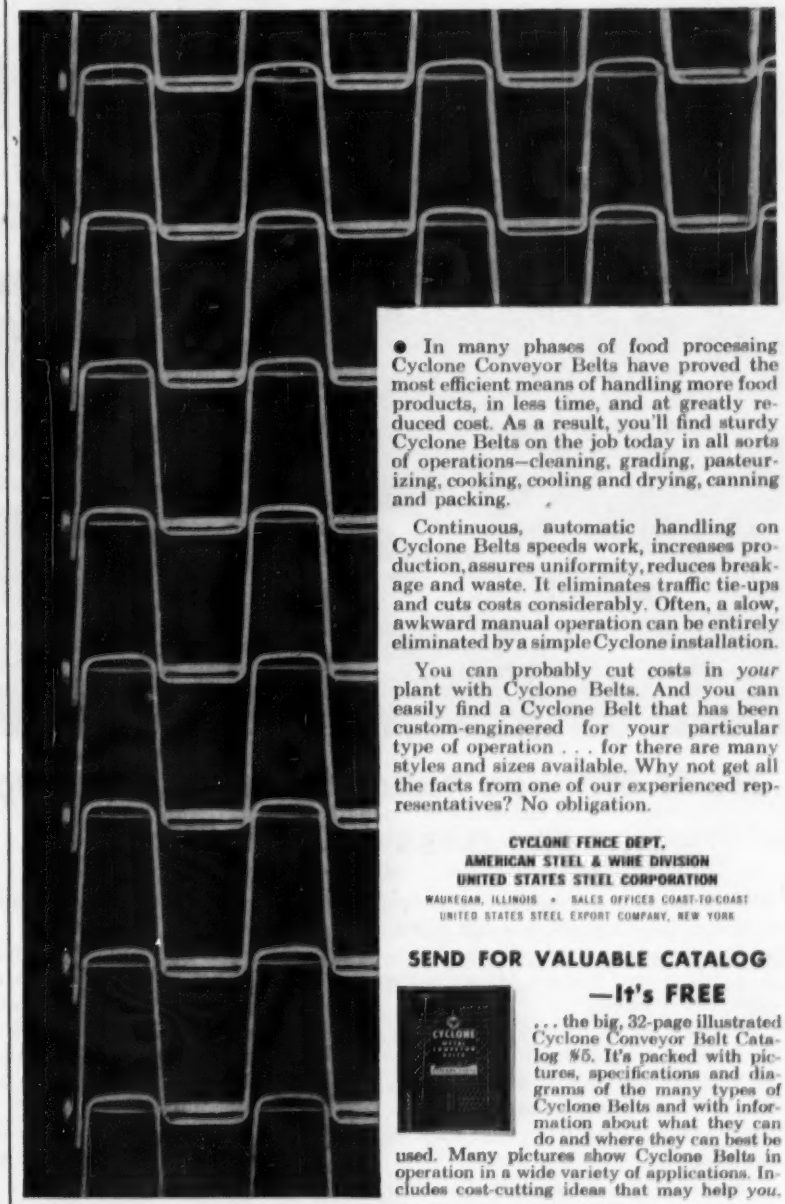
Instrument is installed at the location where temperature is to be maintained and its sensitive rod-and-tube thermal element is immersed directly in the medium to be controlled. Because of unusual construction, the unit may be installed in any position —vertically, horizontally, or diagonally.

Want More Information?

It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service postcard—back of book. Then sign at the bottom and mail.

For your convenience, too, items in this department are listed and keyed in the Reader Service Section.

Food processors find "going automatic" with Cyclone Belts saves time and money



● In many phases of food processing Cyclone Conveyor Belts have proved the most efficient means of handling more food products, in less time, and at greatly reduced cost. As a result, you'll find sturdy Cyclone Belts on the job today in all sorts of operations—cleaning, grading, pasteurizing, cooking, cooling and drying, canning and packing.

Continuous, automatic handling on Cyclone Belts speeds work, increases production, assures uniformity, reduces breakage and waste. It eliminates traffic tie-ups and cuts costs considerably. Often, a slow, awkward manual operation can be entirely eliminated by a simple Cyclone installation.

You can probably cut costs in *your* plant with Cyclone Belts. And you can easily find a Cyclone Belt that has been custom-engineered for your particular type of operation . . . for there are many styles and sizes available. Why not get all the facts from one of our experienced representatives? No obligation.

CYCLONE FENCE DEPT.
AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL CORPORATION
WAUKEGAN, ILLINOIS • SALES OFFICES COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

SEND FOR VALUABLE CATALOG —It's FREE

. . . the big, 32-page illustrated Cyclone Conveyor Belt Catalog #5. It's packed with pictures, specifications and diagrams of the many types of Cyclone Belts and with information about what they can do and where they can best be used. Many pictures show Cyclone Belts in operation in a wide variety of applications. Includes cost-cutting ideas that may help *you*.

USS CYCLONE METAL CONVEYOR BELTS
SPIRAL WOVEN
FLAT WIRE • FLEX-GRID

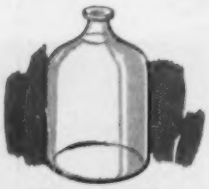
Cyclone Fence
Dept. H-25, Waukegan, Illinois
Please send, without charge or obligation, my copy of Cyclone Conveyor Belt Catalog #5.
Name .....
Company .....
Address .....
City .....
State .....

UNITED STATES STEEL

You name it-MOYNO® pumps it!

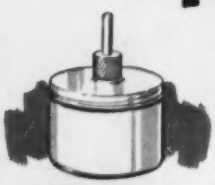
Foods

Potato salad, chow mein, peas, cream-style corn, tomatoes, molasses, chocolate.



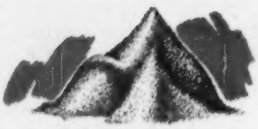
Chemicals

Caustics, acids, dyes, petroleum solvents, soaps, sludges, latex, synthetic resins.



Pastes

Paper coating, starch, seam paste, size, adhesive dope, heavy grease, graphite sludge.



Abrasives

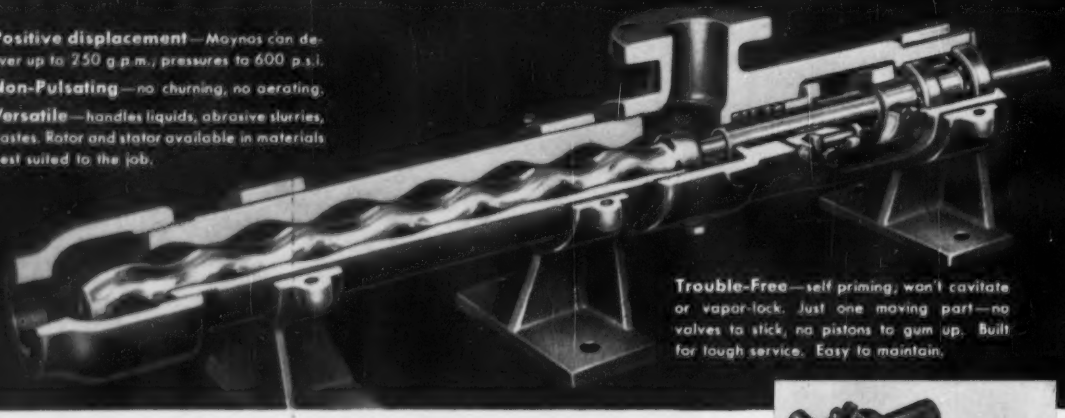
Insulator clay, frit, ground glass and water, porcelain glaze and enamel, cement, plaster.

FEATURES OF THE MOYNO THAT MAY SOLVE YOUR MATERIALS-HANDLING PROBLEM

Positive displacement—Moynos can deliver up to 250 g.p.m., pressures to 600 p.s.i.

Non-Pulsating—no churning, no aerating.

Versatile—handles liquids, abrasive slurries, pastes. Rotor and stator available in materials best suited to the job.



Trouble-Free—self priming, won't cavitate or vapor-lock. Just one moving part—no valves to stick, no pistons to gum up. Built for tough service. Easy to maintain.

R & M Moynos handle almost anything that can pass through a pipe

The Moyno is a problem-solving pump. And whether your problem is one of materials, maintenance or flow, there's a better-than-even chance that the Moyno is the pump you're looking for.

Here is a completely different kind of pump that handles almost anything that will push through a pipe, from free-flowing liquids to non-pourable pastes—even materials containing relatively large particles or abrasives.

This is how the Moyno works: a screw-like rotor turning within a double-threaded stator creates cavities which *progress* toward the discharge end of the pump, carrying the material being handled. The result is a smooth, steady flow, free from pulsation and turbulence.

The pumping elements of the Moyno are available in a wide range of materials, depending upon the substances to be pumped. From stainless steels and synthetic rubber to tool steels, bronze, plastics—there is a Moyno that will do the job you want, and do it with remarkable efficiency.

Industrial-type Moynos are available with capacities to 250 g.p.m.; pressures to 600 p.s.i. Small Moynos (see inset), used as original equipment, serve on washers, water pumps, sprayers, and many other products.

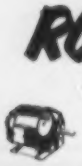
FREE...

this informative bulletin

Tell us your pumping problem—let's see how the Moyno can help solve it. If necessary, we'll be glad to run tests for you in our own laboratories. In any case, get the details on the Moyno. Write for information, address Dept. FE.

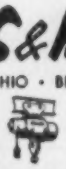
ROBBINS & MYERS, INC.

SPRINGFIELD, OHIO • BRANTFORD, ONTARIO



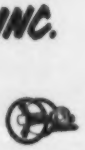
Fractional and Integral HP Motors

Desk, Window, and Household Fans



Hoists and Cranes

Moyno Pumps



Propellair Industrial Ventilating Equipment

See Moyno Pumps at Booth 107 National Canning Show Conrad Hilton, Chicago February 19 to 23

In operation any change in temperature at the thermal element activates a small pilot valve, which in turn varies the control pressure applied to a motor valve or any other final control device. This flexible system is modulating in action, and the final device governs amount of cooling or heating applied to the medium under control.

Its "proportional band" or effective control differential may be quickly adjusted to any spread from 5-25 F. with only an ordinary screw driver. And simple straight-through action of thermal elements to pilot valve eliminates troublesome levers and pivots, thus making disassembly and reassembly easy.

With ordinary tools, action of the pilot valve may be reversed in a matter of 20-30 min., which includes time for checking the calibration of the instrument.—*Fulton Sylphon Div., Robert Shaw-Fulton Controls Co., Knoxville 1, Tenn.*

Circle 142A on Reader Service Card

Y-Type Pipe Strainers Are Easily Maintained

Incorporated in a new line of cast semi-steel Y-type pipe strainers are features designed to minimize maintenance difficulties. New strainers are for use in steam, air, water, oil and gas lines at pressures to 250 lb. There are eight sizes from ¼ through 2 in.

Straight bushing threads instead of pipe threads ease removal of bushing and screen. A copper-asbestos gasket is positioned between base of bushing and body, eliminating possibility of gasket blowout. Only a light torque is required to assure a leak-tight seal. Type 430 stainless steel corrosion-resistant screens are standard, either

Quickly set—holds temperature constant

Here's a proved way to modernize and *save* on your processing operations. With this dependable Sylphon Regulator, you can make quick changes in temperatures for liquids, air or gases. Simple turn of the crank adjusts the temperature to the setting desired. Ideal for applications requiring frequent temperature changes to suit processing stages.

More advantages! You are assured of uniform processing conditions. Spoilage is reduced. Wasteful overheating is prevented. You save manpower, man hours and fuel.

Sylphon Regulator No. 923-Q has many uses: with open and closed tanks, bottle washers, glue kettles, dishwashing machines, slashers and other units. Sturdily built for years of trouble-free service. Recommended as standard equipment. Write for information. Or, ask about a Sylphon Control for *your* specific operations. Send for Catalog CG-D

Robertshaw-Fulton CONTROLS COMPANY

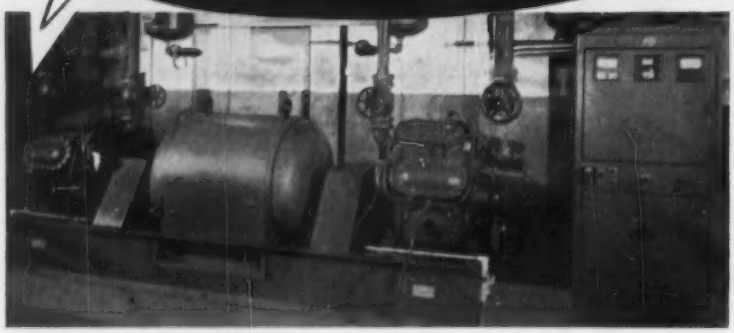
FULTON SYLPHON DIVISION • KNOXVILLE 1, TENN.

For more information, use coupon on last page.

As did the PEET PACKING COMPANY

we suggest you—

CHECK with VILTER



● The Peet Packing Company, a well known meat packer with three up-to-date plants in Michigan, has earned a fine reputation for its wide variety of high-grade meat products distributed by over 3,600 outlets in Michigan. Completely modern throughout in its meat processing and distribution facilities, Peet has standardized on Vilter compressors for refrigeration in all three plants to protect the valuable products it processes daily. Outstanding performance and reliable operation has built unquestioned confidence in Vilter refrigeration.

As diversified as is the Peet meat packing operation, so is the versatility of Vilter refrigeration units which find wide application in many phases of the food and meat packing industry . . . where reliable operation is a must. Vilter users not only secure the advantages of efficient, economical refrigeration, but they also get equipment that helps speed processes, reduces handling, and saves valuable space.

Vilter refrigeration stands for dependability . . . efficient performance . . . and low-cost operation. It will pay you to investigate the many proven advantages of Vilter equipment and make use of Vilter's time-tested know-how to solve your tough refrigeration problems. See your nearest Vilter representative. Your problems will be given prompt attention.

Installed by Robbennolt-Otto Corp., Saginaw, Michigan

Vilter®

Your nearby Vilter Distributor or Representative will be glad to show you how you can save with Vilter. Vilter knows processing.

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY, MILWAUKEE 7, WIS.

Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water and Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice and Polarflake Ice Machines

Equipment & Supplies

perforated with 225 holes of .045 in. dia. per sq. in. or 20 x 100 mesh wire cloth. Screens of other materials available on special order.—*Armstrong Machine Works, Three Rivers, Mich.*

Circle 143A on Reader Service Card

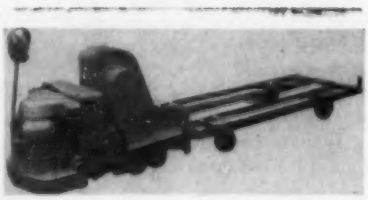
New 'Appearance' Meter Checks Food Color

Developed as a production quality control tool, and not a research instrument, this Model F Agtron unit is being used to check color of grains, baby foods, citrus juices, pulps, and spices.

Originally designed for objectively measuring color of raw tomato pulp, the meter uses two permanent plastic color standards to set the range for a particular product. Unit then assigns direct numerical readings to the color or appearance of the sample.

Meter is light in weight, compact, and said to be easily operated.—*Magnuson Engineers, 509 Emory St., San Jose 10, Calif.*

Circle 146A on Reader Service Card



Trailer Quickly Attaches To New Tractor Unit

Special feature cited for this operator-led tractor is that it couples to any trailer without use of special adapters. Until now, they were re-

starch for foods

soup to dessert

☐ **AMIOCAS** Clearjel, Flotex and Purity SDW—specially processed waxy maize starches, offering exceptional stability, clarity and with little or no starch taste. Do not set to a jel even after long periods of standing. May be used in all products where stability, taste and appearance are desirable properties.

☐ **INSTANT STARCHES** —Instant Jel and Instant Jel P—pregelatinized starches, unique in that they swell almost instantly in cold water, cold milk or fruit juices. Form heavy-bodied, smooth-textured jels with little or no starchy taste. May be used wherever cold water stabilization is required.

☐ **CONFECTIONER'S STARCHES**—Flojel 60 and Flojel 65 are waxy starches used chiefly in the manufacture of gum drops, orange slices, mint leaves and similar confections.

☐ **SPECIALTY STARCHES** —Purity PWS, Purity NCS, Purity C and Purity FL starches. All of these products are specifically designed to meet the various problems arising in the food field.

IF YOU MAKE	WE RECOMMEND
☐ Baking Powder	Redried Starch
☐ Canned Goods	Amioca, Purity D, Clearjel, Purity NCS
☐ Confections	Flojel 60, Flojel 65, Nadex, Moulding Starch L
☐ Cream Pie Fillings	Purity C, Melojel
☐ Dusting Starch	Hoosier Powdered Starch
☐ Frozen Pies	Clearjel, Flotex
☐ Fruit Juices	Clearjel, Purity D
☐ Fruit Pie Fillings	Purity FL, Clearjel, Purity C, Melojel
☐ Glazes	Clearjel, Purity FL
☐ Gravies and Sauces	Clearjel, Flotex
☐ Icings, Meringues	Instant Jel, Clearjel, Purity FL
☐ Meat Binders	Melojel, Instant Jel
☐ Pail Fillings	Purity FL, Clearjel, Purity C
☐ Pudding Desserts	Instant Jel, Hoosier Powdered Starch, Purity C, Clearjel, Purity FL, Redried Starch
☐ Salad Dressing	Purity PWS, Purity SDW, Melojel, Hoosier Powdered Starch, Purity FL, Clearjel
☐ Sugar	Redried Starch
☐ Syrups and Toppings	Clearjel, Purity D, Instant Jel

☑ **CHECK THE STARCHES** you'd like to know more about for use in:

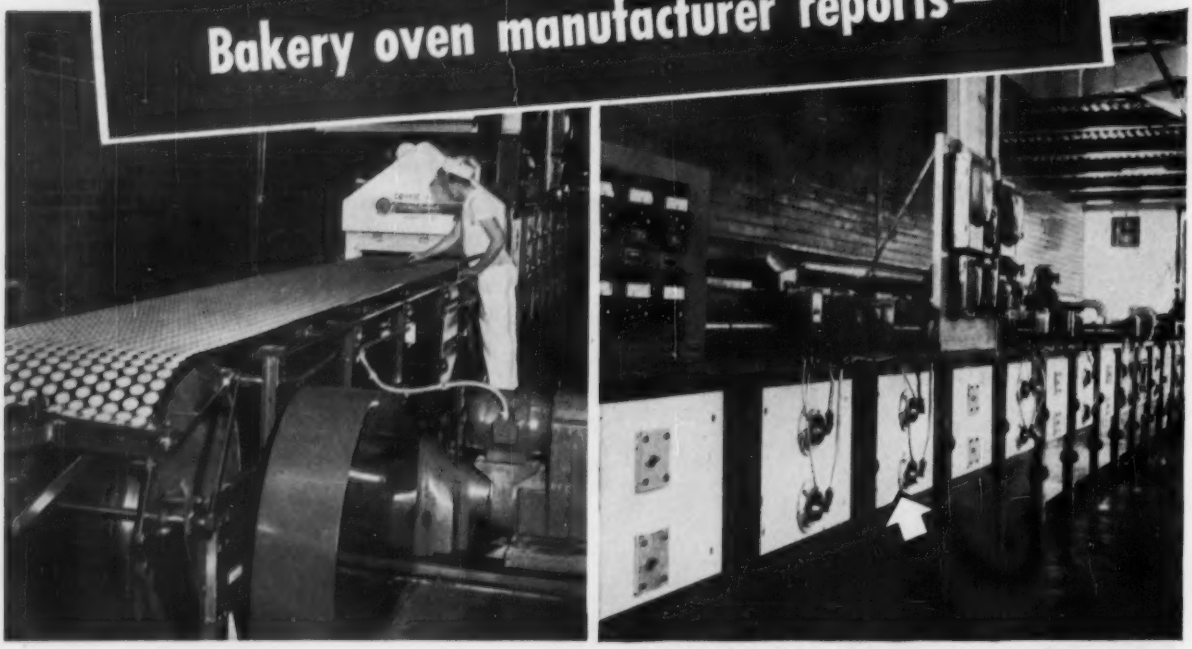
National STARCH PRODUCTS

Address: **NATIONAL STARCH PRODUCTS INC.**

270 Madison Ave., New York 16 • 3641 So. Washtenaw Ave., Chicago 32 • 735 Battery St., San Francisco 11 • and other principal cities.

For more information, use coupon on last page.

Bakery oven manufacturer reports—



Thomas L. Green & Company's new 100-foot band oven, built and insulated with Johns-Manville Marinite (shown by arrow above). Photos by courtesy of "Rippin' Good Cookies," Ripon, Wisconsin.

"Faster heating ... better performance"

for ovens built of J-M Marinite
the non-corroding, structural insulating material

This leading bakery oven manufacturer, who designs for lasting customer satisfaction, obtains several major advantages by using Johns-Manville Marinite*, the structural insulating material:

(1) Marinite-built ovens heat up faster than ovens with all-metal construction. (2) Marinite provides better heat control and more flexibility—temperatures may be quickly raised or lowered for baking different products. (3) Marinite saves space and weight, yet affords the same thermal insulating effectiveness as blanket-type insulation supported by heavy metal construction.

Equipment users find other advantages . . . In addition to superior performance, operators of ovens, driers and other high temperature equipment obtain almost unlimited service life from Marinite. This asbestos material combines structural strength and durability with efficient thermal insulation. It requires virtually no maintenance. It does not rot or corrode. It will not disintegrate in water. It requires no finish or protective facing for normal service.

To learn how Marinite can improve your equipment, write Johns-Manville, Box 60, New York 16, N.Y. In Canada, 199 Bay St., Toronto 1, Ontario.

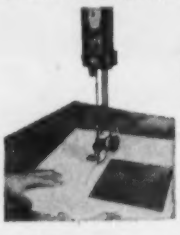
*Marinite is a registered Johns-Manville trade mark.

MARINITE builds and insulates in one operation

large sheets speed construction, afford maximum heat control

MARINITE is strong

provides structurally strong monolithic walls—requires minimum angle-iron framing



MARINITE is easily worked

may be cut, drilled, shaped with ordinary woodworking tools, by plant labor

Johns-Manville FIRST IN INSULATION

MATERIALS • ENGINEERING • APPLICATION

quired because of varying heights of trailers in industrial plants.

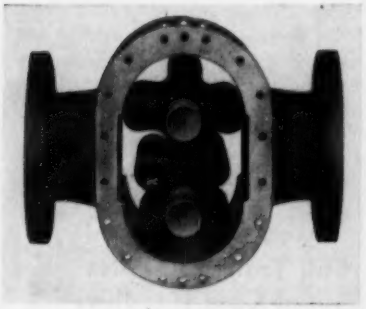
Called Uni-Grip, it couples to any trailer of 5½-12¾ in. clearance from the floor. And almost every factory trailer falls within these limits. Quick coupling is accomplished by a hydraulically-operated draw bar. Here's how it works:

Draw bar gripping tip, which extends 10 in. beyond the length of the tractor, is guided into position beneath the trailer and raised. As soon as the weight of the trailer exerts a pre-determined pressure on the bar, it automatically retracts, drawing the trailer tightly up against the buffer plates on the end of the tractor.

Simultaneously, fixed wheels at the draw bar end of the tractor are retracted, and the caster wheels lowered. Fixed wheels are used when the tractor is unloaded, and caster wheels when the load is being pulled. Entire operation is completed within two seconds, and is entirely governed by a single button in the operating handle. In addition, disconnecting by means of a conventional lowering lever is equally simple.

Draw bar is 5½-in. wide and has a 12-in. retracting action. Its pull is 175 lb. normal and 800 lb. ultimate. Tractor wheel base, when uncoupled, is 30 in., while overall length of the unit with draw bar retracted is 61½ in. Overall width is 30 in. Travel speed is 3 mph. unloaded, 2.25 mph. loaded. Maximum trailer load is 6,000 lb. and tractor weight without battery is about 1600 lb.—*Automatic Transportation Co., 149 West 87th St., Chicago.*

Circle 146B on Reader Service Card



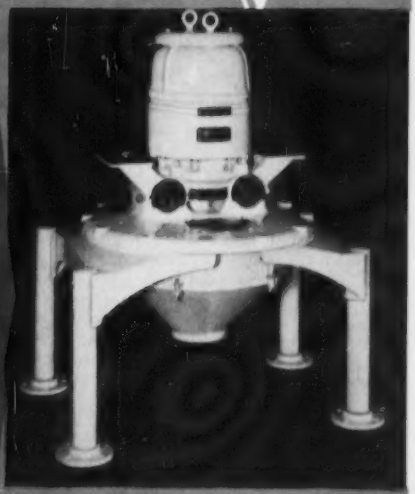
New Model Rotary Pumps Handle Range of Fluids

Efficient, low-cost handling of all types of liquids is reported for this new line of positive displacement rotary pumps.

"ENTOLETER"
HIGH SPEED MIXERS

• decrease mixing time
• process more material
• make good products better

ALL AT
LOWER COST TO YOU!!!



Have You Considered an "ENTOLETER" High Speed Mixer Application for Your Product?

Possibilities for new "ENTOLETER" high speed mixer applications are being worked on continually in our laboratory in New Haven. Let us process a sample for you without cost, and return it for your evaluation.

ENTOLETER DIVISION
The Safety Car Heating and Lighting Company, Inc.
P.O. BOX 904—NEW HAVEN 4, CONN.

The trademark "ENTOLETER" is your guarantee of satisfaction.

For more information, use coupon on last page.

LUNN PLASTIC TRUCKS HAVE SUPERIOR STRENGTH

New lightweight all fiber glass plastic cab and truck body

These facts convinced United Parcel Service, serving thousands of stores, to invest in reinforced plastics for their delivery trucks:

Strong and Durable

Strength-to-weight ratios better than steel. Will not dent, has outstanding impact resistance.

Lightweight

40% lighter than metal trucks. Longer tire life, less gasoline consumption, greater payloads.

Less Maintenance Costs

Corrosion and rot proof. Resists most acids and solvents. Needs no painting. Repair made easily and inexpensively, no elaborate equipment is required.

Better Design

Reinforced plastics offer better design possibilities for modern styling. Smoother, sleeker lines easily molded with this amazingly durable material. Permanent gloss and lifetime colors are impregnated into the plastic.

Better Roadability and Safety

Lower center of gravity eliminates top heaviness. Truck *holds* road better. Vibration-free, no metal joints. Easier to maneuver. Less driver fatigue.

Plaskon Polyester Resins for UPS trucks supplied by Barrett Div., Allied Chemical & Dye Corp., N. Y.

About Lunn

Lunn's plastic cabs and trucks are revolutionizing the automotive industry. A leader in reinforced plastics, Lunn has pioneered many "firsts": body parts for Chevrolet's Corvette, and the Kaiser Darrin, bathtubs, airplane structural parts, aircraft fuselages, trays, tote boxes and many other new industrial products.

LUNN INDUSTRIES

General Offices: Huntington Station, N.Y.

Plants: Huntington Station, N. Y.; Ashtabula, Ohio; Detroit, Mich.

Equipment & Supplies

Made in a range of sizes with capacities up to 2,200 gpm, and pressures up to 1,000 psi. these fully reversible units pump water, high viscosity fluids, and solids up to 78%. Furthermore, pump action does not break up semi-solids or aerate liquids to be moved.

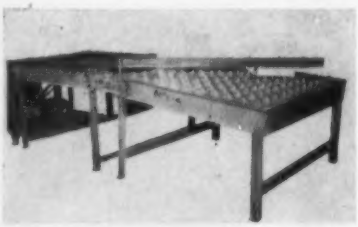
Operation is simple. Under the positive displacement principle, unmeshing of the rubber impellers produces a vacuum that draws liquid into the space between the lobes. Liquid is then carried between the lobes and case housing to the opposite side of the pump, thus forcing it into the discharge line.

Pump ports are so shaped that fluid spreads across the full width of the impellers, and velocity is coordinated with speed of the pump impellers. As a result, liquid passes through the pump with minimum turbulence and friction. Unit's new design provides quietness and compactness with means for handling a wider range of viscosities at standard motor speeds.

Because there are no valves to stick or pistons to gum up, these pumps require minimum maintenance, and water or other liquids keep impellers continuously self-lubricated. Built for tough, heavy-duty service, only parts subject to wear are the impellers. When impellers do need changing, they may be replaced in a matter of minutes without breaking lines.

Installation may be above level of the liquid to be pumped, or at a considerable distance from the source. Pumps are self-priming and do not cavitate or vapor lock. — *Lindquist Pump Corp., 1001 W. Jefferson Blvd., Culver City 12, Calif.*

Circle 149A on Reader Service Card



Ball Transfer Tables Speed Case Handling

When used at transfer points of gravity or power belt conveyor lines, this new unit is said to save time and cut handling costs.

Table, which operates with ball casters, is available in any length or width. And it accommodates any size

here's your guidepost to lower food processing costs

Here is your new handbook on the uses and advantages of the most versatile material you can use in your processing equipment — Crucible Rezistal® stainless steel. In its 40 pages, this new Crucible book tells you why stainless is so easy to clean . . . so rugged . . . and so effective in preventing contamination of processed foods.

Crucible stainless is a family of alloys that combines corrosion resistance, structural strength, wear and abrasion resistance, dense-smooth surface, and the ability to withstand extremes of heat and cold. In this book you'll find data confirming why Crucible stainless steel is your most valuable production ally. A copy should be on your desk now. Better fill out the coupon today.

a

b

c

d

Food Specialists — Note . . .

If your interests are primarily in the BREWING . . . DAIRY . . . MEAT . . . or SOFT DRINK Industries, you'll find specific helpful information in these Crucible books which show how you can make the most of stainless steels in these fields. Any of these books are yours for the asking.

e

Crucible Steel Company of America
Dept. FE, Henry W. Oliver Building
Pittsburgh, Pa.

Please send me books circled
A B C D E

Name _____ Title _____

Company _____

Address _____ City _____ State _____

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **STAINLESS STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

For more information, use coupon on last page.

URGENT: To all frozen food processors

FX-1201

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable symbol above or preceding the address.

WESTERN UNION

W. P. MARSHALL, PRESIDENT

SYMBOLS

DL = Day Letter
NL = Night Letter
LT = Int'l Letter Telegram
VLT = Int'l Victory Ltr.

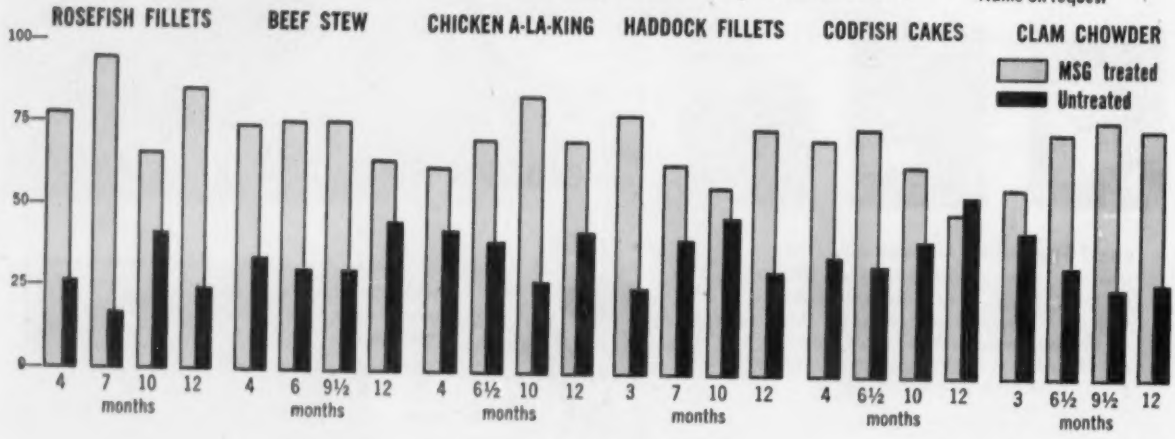
The filing time shown in the date line on telegrams and day letters is STANDARD TIME at point of origin. Time of receipt is STANDARD TIME at point of destination

WUN001 PD=NEW YORK NY JAN 6. 1955=

FLASHING YOU RESULTS OF 12-MONTH FLAVOR TEST OF MSG-TREATED FROZEN FOODS VS UNTREATED FOODS AT A LEADING UNIVERSITY* STOP 23 OF 24 TASTE TESTS SHOW MAJORITY OF TEST PANEL PREFERRED FLAVOR OF MSG-TREATED SAMPLES TO UNTREATED SAMPLES STOP. NOTE MORE THAN 2 TO 1 PREFERENCE IN 13 OF THESE TEST PERIODS STOP TEST ALSO REVEALED MOST EFFECTIVE USE-LEVELS FOR MSG STOP PROMISES NEW OUTLOOK FOR STORAGE AND WAREHOUSING PROBLEMS. HOLD-OR-SELL. AND PRODUCTION PEAKS AND VALLEYS STOP YOUR COPY FULL REPORT WAITING AT HURON TECHNICAL SERVICE. 9 PARK PLACE. NEW YORK 7. N. Y. STOP WRITE. WIRE OR PHONE TODAY STOP=

Graphs show percent of test panel preference during 12 months' storage. Flavor tests conducted by university technicians.

*Name on request



B.4.10

Huron MSG

PURE MONOSODIUM GLUTAMATE 99+%

Made by the American pioneers in protein derivatives

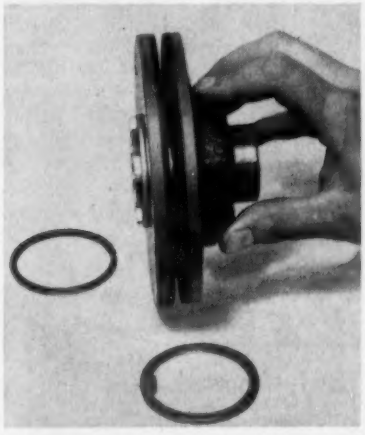
FACTORIES: Harbor Beach, Michigan

SALES OFFICES: 161 E. Grand Avenue, Chicago 11 • 607 Second National Building, Cincinnati 2 • 383 Brannan Street, San Francisco 7

carton, case, or material with a smooth, firm bottom. A flow directional arm, mounted on a bracket, enables operator to easily direct material over transfer table to proper conveyor trunk line.

Unit moves material in any desired direction, thus permits smooth operation at packaging stations of shipping rooms. Goods are sent to packaging station over main conveyor line. Then packer uses transfer table to quickly move items to shipping stations.—*Speedways Conveyors, 202 Rhode Island St., Buffalo 13, N. Y.*

Circle 150A on Reader Service Card

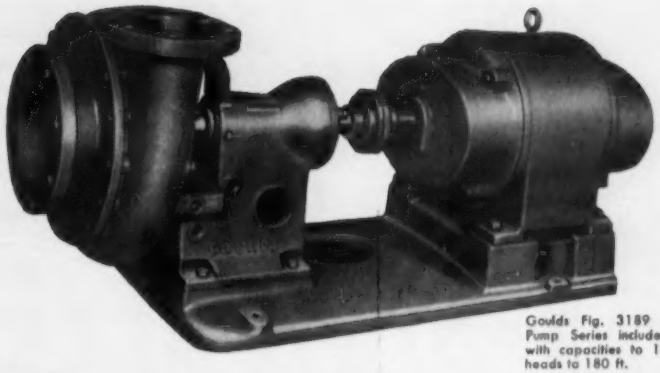


Overload Clutch Features High-Friction Disks

Conveyors, automated machine tools, materials-handling equipment and packaging machinery are termed ideal applications for this line of machinery-drive over-load protection devices. Units feature new high-friction disks and an adjusting nut locking arrangement.

Called Torque Limiters, they are slip-type friction clutches upon which can be mounted such drive components as standard Type A plain plate roller chain sprockets, special V-belt pulleys or gears. Acting as automatic shear pin mechanisms, they avoid time and labor required to insert new shear pins.

Drive component is set on a powdered metal bushing in the clutch and clamped between two friction disks by action of an adjustable spring. When an overload is imposed on a machinery drive, the sprocket, or related drive component, breaks away from the clutch disks. It slips at from ½-¼ the torque setting until motor is shut off and overload condition is corrected. Furthermore, no resetting is needed to make the unit operative



Goulds Fig. 3189 Centrifugal Pump Series includes 10 sizes with capacities to 1080 GPM; heads to 180 ft.

interesting facts

...about a new series of Goulds Multi-Purpose Centrifugal Pumps

Newest in a line of heavy-duty centrifugal pumps reputed for their dependable, trouble-free operation, the Goulds Fig. 3189 Series offers you:

Versatility — You can use the Fig. 3189 single-stage, open impeller pumps for general water service, irrigation, circulation, slurries, transfer, factory wastes and for air conditioning. You can choose just the right pump for your need from 10 sizes with capacities ranging up to 1080 gallons per minute, with heads up to 180 feet at 1750 RPM.

Economy — The Fig. 3189 Series is made in the Goulds tradition—they're built to work hard and to last long. Their design accommodates wide interchangeability of parts, greatly reducing parts inventory requirements where many pumps are used.

Low Operating Cost — Modern hydraulic design provides high operating efficiency with relatively low power consumption. Impellers are statically and hydraulically balanced for smooth operation.

Operating Convenience — You can adapt the Fig. 3189 pump to various piping arrangements by swiveling the discharge nozzle to any one of three positions.

Maintenance Convenience — Wide openings in the support head give ready access to gland and stuffing box. Bearing housing is completely sealed to exclude moisture and dirt. *You can safely use the unit outdoors without fear of dirt harming the bearings and you can hose it down without fear of water damage.*

For specifications, performance curves and other interesting design details that contribute to long, economical service, send for illustrated Bulletin 720.4.

MEMBER

Goulds PUMPS INC. Seneca Falls New York

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK
PHILADELPHIA • PITTSBURGH • TULSA

...AND *Automatically* YOUR PRODUCT IS PACKAGE-WRAPPED AT *3 to 5 units per second!*

Unbelievable savings in time, labor and materials are yours with the Campbell Wrapper. Automatic continuous feeds and deliveries combined with easy, simple operation permits one person to tend and operate several machines at one time in many cases. Then too, because no trays or stiffeners are required *unless desired*, you cut material costs from 25 to 50%. With the Campbell Wrapper packaging production soars to new heights too, for it automatically crimps, heat or glue seals your products, in any type wrap material, at average speeds of *100 to 300 units per minute!* Wraps regular or irregular shaped products — single or multiple per unit with equal ease and speed. Simplified adjustments require minimum down-time for size change-over. Whatever your product—investigate now, how you can *save* with the Campbell Wrapper.

FOR THE ARMED SERVICES
We are contributing to the nation's defense program by providing a large part of our increased production facilities for building precision armaments. Civilian orders are filled on a reasonable time basis only.

New! Completely revised free booklet—Write for your copy.

Campbell WRAPPER

HUDSON-SHARP MACHINE CO. • GREEN BAY, WIS.

Manufacturers of Aniline and Gravure Presses, Folders, Interfolders, Laminators, Waxers, Embossers, Slitters, Sheeters, Roll Winders, Packaging Machines, Crepers and Tissue Converting Units.

NEW YORK: 55 WEST 42 STREET

Equipment & Supplies

after the overload is removed.

Friction disks, which are not bonded to the clutch plates, are an asbestos, phenolic resin and brass chip mixture molded under high pressure. This produces a lining with stable friction qualities under a wide range of temperatures and pressures that does not absorb oil or moisture. Disks have a friction coefficient of 0.35 and replace former asbestos or rubber-phenolic composition disks with a 0.25 friction coefficient. In drives where vibration is present, a setscrew and brass plug locking assembly are added to the cast iron adjusting nut to avoid adjustment problems.

Torque limiters are available in eleven standard models with maximum torque capacities from 20-620 ft-lb. Outside diameters are from 2-3⅞ in., and units can be mounted on shafts from ½-2½ in. dia. Clutches can mount standard sprockets having pitches from ½-1¼ in., and varying thicknesses. Standard spacers and bushings are provided for this purpose. —*Morse Chain Co., 7601 Central Ave., Detroit 10.*

Circle 153A on Reader Service Card

New Chemicals

Easily-Applied Primer Resists Corrosion

Excellent resistance to under-cutting by corrosion, when cover coats of new or corroded steel surfaces are mechanically damaged, is reported for a new liquid primer.

Known as Lock Prime, it may be applied by brush or roller directly from the can. On either sandblasted new steel, or wire-brushed rusted steel, this material forms a tight adherent bond to the surface and provides good adhesion for following top coats of liquid Neoprene or chlorinated ali-

OTHER DEPARTMENTS

Featured in This Issue

Practical Ideas	page 5
Editorials	116
New Packages & Products	162
Advances in Technology	171
Questions & Answers	188
Useful New Books	196
Keeping Up With the Field	199
Recent Inventions	210
Men and Companies	216
Just Off the Press	220

JAMISON
HAGERSTOWN, MARYLAND, U. S. A.

introduces **FROSTSTOP**
. . . a new feature

keeps doors from freezing shut

- **Prevents loss of refrigeration**
- **Helps gaskets last longer**
- **Prevents damage from prying open**

ICE FORMATION PREVENTED both at the frame and the sill area which the door gasket contacts. Jamison's new "Frostop" feature stops icing even with freezer room temperatures as low as —50°F.

HEATED METAL PLATES FOR GASKET CONTACT. They are electrically-heated and controlled by an adjustable thermostat to a temperature above the dew point of surrounding air. Since this prevents condensation, it also stops freezing.

This new "Frostop" feature is now available as an optional item on all Jamison Doors for low-temperature service. Get all the facts by writing to JAMISON COLD STORAGE DOOR CO., Hagerstown, Md.

Koven

WAS MAKING INDIVIDUALIZED FOOD EQUIPMENT

The signal was given—and instantly thousands of eager men, women and children rushed into the Oklahoma Territory, anxious to claim a rich stake. But, even before this history-making land-run, KOVEN Individualized Equipment was already at the service of the growing food industry. And today, when food has become one of America's most important industries, dependable, cost-cutting KOVEN units are found in leading food plants throughout the country.

All KOVEN Individualized Equipment is specially designed to fit the needs of a specific operation—that's why it makes production more efficient—and therefore more economical. See for yourself how these expertly fabricated units can help you achieve your highest production level. Call or write for a consultation—no obligation. Send for Bulletin #550.

X-RAY INSPECTION FOR QUALITY CONTROL

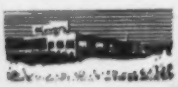
KOVEN equipment in all metals and alloys include: High pressure vessels, extractors, mixers, stills, kettles, tanks, stacks, breechings. Shop and field erected storage tanks. High vacuum testing.

Fabrication to all A.S.M.E. Codes

Plants:

Jersey City, N. J.

Dover, N. J.



Trenton, N. J.

L. O. KOVEN & BRO., INC.
154-D Ogden Ave., Jersey City 7, N. J.

Stainless steel pressure vessel

Nickel hopper

Jacketed processing tank

KOVEN FOR INDIVIDUALIZED EQUIPMENT SINCE 1881

phatic hydrocarbon. And it is equally effective in acidic and organic atmospheres.

Applicable to all ferrous metal surfaces, this tile-red primer contains 28% solids and covers 200 sq. ft per gal. per one mil coat. Since bond strength of the product actually increases with age, immediate application of a top coat is therefore unnecessary.

Primer is filled in 1 gal. cans and 5 gal. drums.—*Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7.*

Circle 154A on Reader Service Card

"Tamed" Iodine Employed In Germicidal Cleaner

This new industrial cleaner is compounded to kill bacteria and germs in a matter of minutes. Called Wescodyne, it bases its germicidal action on chemically stabilized iodine, a new development.

In this form, the product reportedly retains its potent antiseptic properties, but chemical processing has reduced its toxicity and sting to a point where they no longer are limiting factors in using iodine as a germicide.

As an all-purpose cleaner and disinfectant, this product has the unique property of visually indicating its own activity. In solution, it has a yellow-brown tint that persists as long as the germicide is effective. When the color completely fades, the solution is no longer active and should be replaced.

Cleaner is effective in both warm and cold water, and hard water does not impair its action.—*West Disinfecting Co., Long Island City, N. Y.*

Circle 157A on Reader Service Card

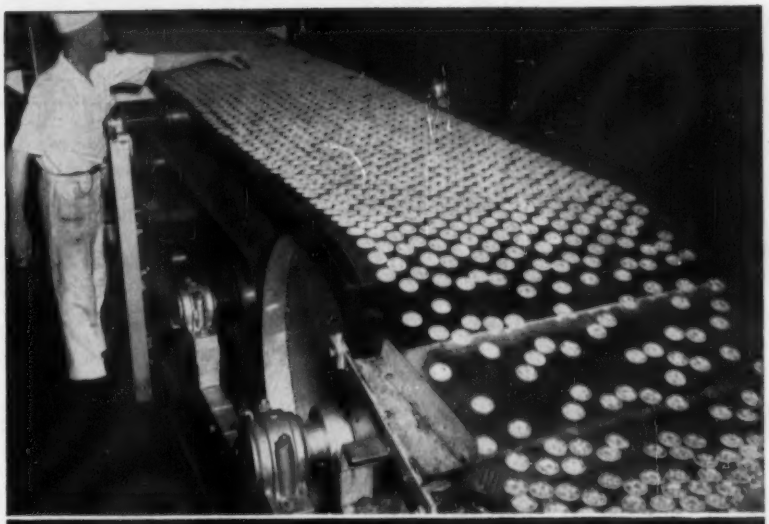
Spray-On Paint Remover Does Fast, Clean Job

Said to be cleaner and easier to use is a new spray-type paint remover, called Blister-Off.

Its active ingredients cause tiny bubbles to form on paint. These rise cleanly from the surface, thus are ready to be wiped or scraped off. And except for stubborn cases, one application is called sufficient for the purpose.

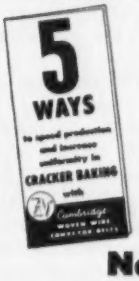
Product is packaged in 12-oz. containers, along with spray heads.—*Wilbur & Williams Co., 130 Lincoln St., Boston, 35.*

Circle 157B on Reader Service Card



FEWER BURNED CRACKERS

WITH *Cambridge*
WIRE MESH CONVEYOR BELTS



Regardless of what you're baking, you'll get a more uniform product by seasoning, baking, cooling, packaging at controlled speed on continuously moving wire mesh belts. Open mesh provides uniform heat distribution and free circulation for cooling . . . eliminates sticking. Write for detailed discussion of how Cambridge Wire Mesh Conveyor Belts can speed production by minimizing manual handling.

No matter what food or process . . .

. . . canning, freezing, baking . . . meat, poultry, candy, fruit or produce . . . Cambridge Wire Mesh Conveyor Belts can reduce your operating costs and increase product quality by continuous uniform processing with reduced manual handling. Lifelong rust-protection, quick drainage of process solutions, lack of odor and freedom from contamination are only a few advantages. All-metal belt is impervious to damage from heat and cold. There are no sharp edges because Cambridge belts are woven from round wire.

Cambridge Wire Mesh Conveyor Belts are made in any size, mesh or weave, and from any metal or alloy. Special raised edges or cross-mounted flights to hold your product during movement are available.

Call in your Cambridge Field Engineer to discuss how you can cut food processing costs by continuous operation. You can rely on his advice. Write direct or look under "BELTING, Mechanical" in your classified telephone book.

ASK FOR FREE 130-PAGE REFERENCE MANUAL illustrating and describing wire mesh conveyor belts. Gives mesh specifications, design information and metallurgical data. Ask for Special Industry Folder on your operation.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

DEPARTMENT Q, CAMBRIDGE 2, MARYLAND

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

For more information, use coupon on last page.

TEAR OUT AND MAIL!

YES! I would like to know more about

STAR-KIMBLE

Special Motor Designs

☐ If your sales engineer will give me a ring, I'd like to talk to him AND IN THE MEANTIME, you might send me your bulletin on Standard

☐ SQUIRREL CAGE
☐ BRAKEMOTORS
☐ WOUND ROTOR
☐ D-C MOTORS
Generators, M-G Sets

*My name is*_____

*They call me a*_____ *(title)*

*At*_____ *(company)*

_____ *(street address)*

_____ *(city) (zone) (state)*

STAR-KIMBLE
MOTOR DIVISION
Miehle Printing Press and Mfg. Co.
207 Bloomfield Ave., Bloomfield, N. J.

Test of Flooring

—*Continued from page 92*

surface depressions, these sucrose materials might have accumulated despite repeated sweepings and hosings, eventually decaying and causing local erosion.

When the new plant was built by Turner Construction Co. in 1927, over 400,000 sq. ft. of Kalman absorption process concrete floors were put down. Today, 28 yr. later, every square foot is still in daily use. Only 1,746 sq. ft. were resurfaced (in the course of departmental rearrangement and conversions).

Large Savings

If Schrafft had not foresightedly conducted these evaluation tests, and had instead specified one of the floors that failed, it would have been faced with the necessity of resurfacing all concrete floors within 10-15 yr. at a cost of about $400,000. Nor would that have been all. A second 10-15 yr. period would be coming to an end just about now, with the possible need for more resurfacing.

Add to this the expense of interrupted production because of floor breakdown, uneven flow of materials and equipment, high cost of maintenance, insanitary conditions, and impaired safety and employee morale.

Operating procedures come into the picture. Schrafft's methods today only vaguely resemble the procedures employed in 1927. The company has stayed in the fore of candy manufacturers by constant improvement of production, packaging, distribution, and marketing.

Postwar Modernization

Since the war, the company has spent over a million dollars in renovation and modernization. Conveyors have been installed, equipment modernized, and many new machines purchased. And currently the company is spending several hundred thousand dollars modernizing the machine-dipping and center-casting departments.

In these successive modernization phases, the original floor has proved adequate to every new demand. Even the advent of fork-lift trucks toting loads up to 10,000 lb., the effect of small wheels of hand trucks, the innumerable washings with a solution of trisodium phosphate and water (starch spillages and trackings of sugar water and chocolate necessitate daily scrubbings) have not caused deterioration.

In the machine shop, where unavoidable oil and grease spots have had an opportunity to do their worst for almost three decades, the floors are still in good condition.

The strict sanitary and maintenance procedures practiced by the candy maker have contributed, of course, to the flooring's long life. The company realized that a properly maintained floor would last much longer than a poorly maintained one. In addition, it contributes to safety and employee morale.

Any spot of oil or grease, particularly in the machine shop, is cleaned up immediately. Most floors are washed every night. Rubber tires have been installed on all lift trucks. Plant housekeeping rules are strictly enforced.

The company has drafted further expansion and modernization plans as the national call for its candies increases. The engineering staff is constantly on its toes adapting the physical capabilities of the plant to the new demands. The task is made decidedly easier by not having to worry about floor service life.

End (*Resume reading on page 92*)

Carries Payload

—*Continued from page 114*

this carrier, when compared to others, are the roof, loading hatches, and the three hoppers attached to its floor.

Inside, the conventional floor, directly over these hoppers, is divided into three sections. Two of these are hinged and may be raised to form front and rear bulkheads. The third section is removed and stowed in that part of the trailer (front or rear) not used for sugar space.

This sugar "bin" occupies 18 ft. of the length of the carrier. It is located slightly to the rear of the unit to meet axle load requirements. The three unloading hoppers form the floor of the bin in this aluminum-constructed trailer.

To convert it for sugar hauling, the two sections of floor are raised into place to form bulkheads. The small center section is removed. Then, a plastic-cloth bag, which completely covers the interior of the bin, is hooked into place. This bag is stowed in one of the unloading hoppers when not in use.

Sugar is chuted through the top hatches. To obtain the proper weight distribution for tractor and trailer axle, the 40,000-lb. load is arranged on a 20-deg. angle of repose, the shortest depth being that at the front section. No difficulty in load shifting has been experienced in 9 months of operation.

Three binder chains and cross

braces, located directly behind each temporary floor-bulkhead, hold the trailer's walls in vertical plane and prevent bulging. The floor and chassis of the carrier are additionally strengthened to meet requirements of this centralized 20-ton load.

Plant Accommodations

At the plant, three receiving hoppers are mounted flush with the roadway and spaced in conformity with the truck discharge hatches. Gasketed plates provide protection and sanitation for these hatches. Each hatch also has a butterfly valve, which is opened for gravity sugar unloading.

After positioning the trailer properly over the receiving hoppers, sugar is delivered from the trailer into a screw conveyor. This conveyor moves it under the roadway, into a bucket conveyor, and thence into the bulk sugar storage tank. Unloading time is about 2 hr.

The trailer's side door is located ahead of the sugar bin section. Both the front and rear sections are used, whenever possible, for hauling light goods, such as pallets, cased empty glass, etc., even when sugar is being hauled.

End (Resume reading on page 116)

Tips on '55 Labor

—Continued from page 62

industrial policy.

The wide application of GAW would lead to industry-wide systems of government reinsurance, and eventually to guaranteed job security through government fiat.

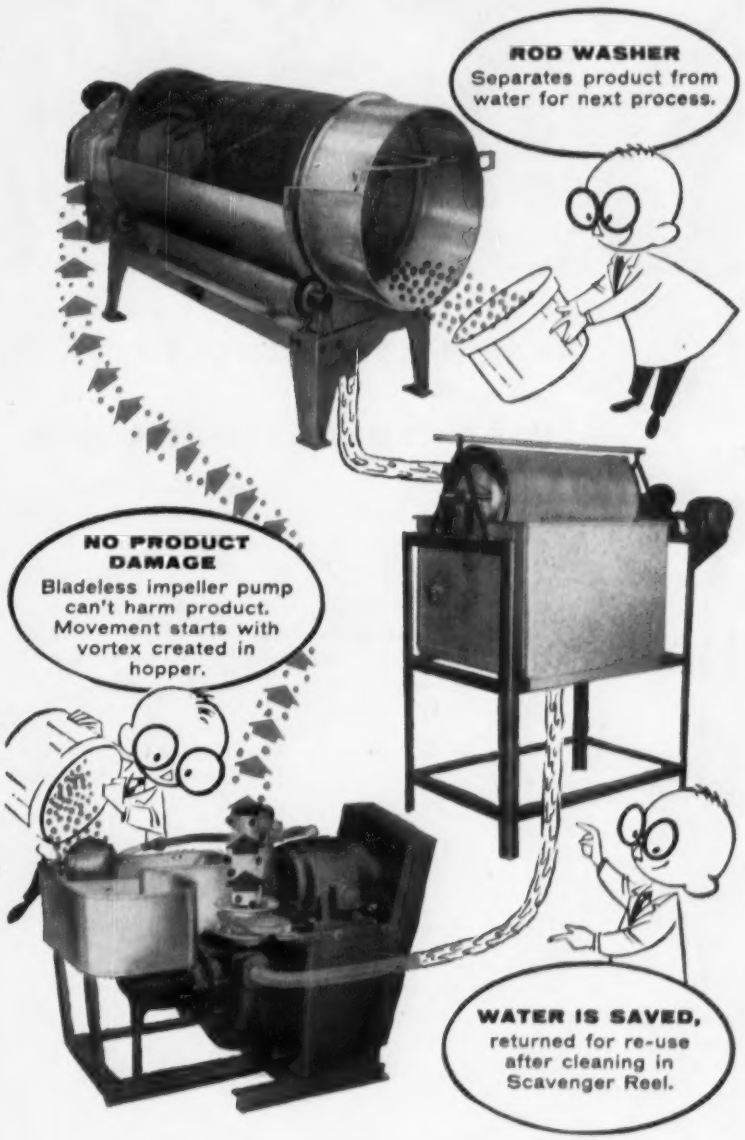
2. GAW in itself cannot iron out cyclical fluctuations and promote economic and employment stabilization.

It cannot prevent business mortality, cannot hold off fluctuations among individual companies within the same industry, cannot offset the divergent upward and downward trends prevailing among different industries.

For example, during the past 15 years a large number of industries expanded employment by more than 200%, some by more than 300%. In the same period other industries decreased their employment. Net effect was a nationwide rise of 65% in total employment. Even in those industries where a strong upward growth was occurring, some individual companies experienced a decline in output and in employment.

Growth with dynamic change in different industries, and in different companies within the same industry, is the characteristic pattern of the American economy. Few companies

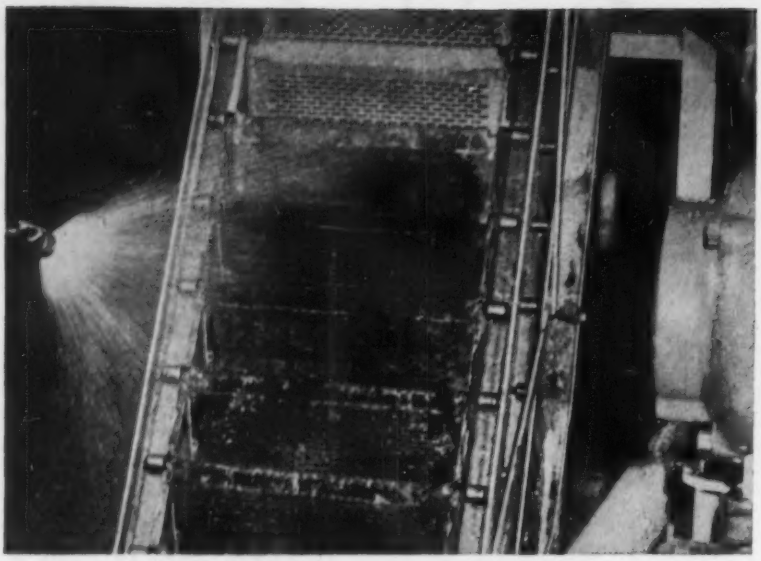
Economical . . . Sanitary
HYDRO LIFT CONVEYING
by CRCO
"SAY "SEE-AR-CO"
CLEANS AS IT CONVEYS


ROD WASHER
Separates product from water for next process.
NO PRODUCT DAMAGE
Bladeless impeller pump can't harm product. Movement starts with vortex created in hopper.
WATER IS SAVED,
returned for re-use after cleaning in Scavenger Reel.

Economical and sanitary. Write for further information if you have a pumping or conveying problem, regardless of product.

THE BEST OF Everything
CHISHOLM-RYDER CO. INC.
Niagara Falls, New York
FOR THE FOOD PROCESSOR

For more information, use coupon on last page.



Here's the key to faster spray-sanitation

Now you can zip right through sanitation chores easily by putting to work one of the deadliest and fastest bacteria-killing combinations known. Oakite Bactericide is the bug-killer and the Hozon Unit is the key to quick application.

Here's the simple Oakite system for wiping out contamination. In an ordinary bucket, water-mix pre-determined ppm solution of Oakite Bactericide. Hook up your Hozon Unit between water outlet and hose. Place the Unit's small siphoning tube in solution. Turn on the water and start spraying.

Water pressure sucks the Bactericide solution through the hose and discharges it at the nozzle at the exact ppm you want. You sanitize just as you water your lawn, reaching all areas no matter how inaccessible.

Because of its low pH, Bactericide goes to work immediately beginning its killing action within 5 seconds after application. Harmful bacteria are knocked out quickly preventing costly spoilage. Bactericide and Hozon—a combination you can't beat.

And here's news. The Hozon Unit is given FREE to purchasors of either Oakite Bactericide or Oakite Sanitizer No. 1. Write today and get complete details on how you can have faster, more effective plant sanitation. FREE booklet on request. Oakite Products, Inc., 26G Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING

OAKITE

MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U.S. & Canada

can look ahead to future years and guarantee for themselves a certain level of profit or employment. Adoption of a definite guaranteed annual wage program will increase the break-even point of a company, transfer wages to a fixed cost, and imperil company solvency in event of any business decline in the future.

3. Widespread adoption of GAW and employment programs will tend to drive smaller firms out of business and will lead eventually to cartelization of American industry.

GAW would not be limited to a few large industries. Like all other labor movements it will become an integral part of industry-wide negotiation toward the objective of a standard industry-wide pattern. No total industry can operate with such a program if individual companies within the group experience divergent ups and downs under competitive pressures.

Ultimate outcome of general adoption of GAW will be establishment of industry planning, company quota systems, and regulated investments. Coupled with industrial unionism, this can only lead to a form of cartelization with industrial counsels and some form of codetermination.

The pay check does not constitute the sole basis of sound labor-management relations. Fringe extras have been provided as a means of securing and holding competent workers.

Even without unionism, enlightened business management evolved and expanded a variety of fringes. Without unionism this trend would necessarily continue, and the magnitude of these benefits would advance with the economic growth of business.

Individually many of these fringes are reasonable and logical. But every company must call a halt somewhere to expansion of the total cost package. If fringe benefits are to be controlled properly and if common sense is to guide the future evaluation of fringe benefits, each employer must take these three steps:

1. He must set up a cost-analysis system that will measure adequately the complete cost of fringes in his company.

2. He must develop and maintain effective communications with his employees so they understand the income and cost equivalents involved.

3. He must enter every union negotiation with adequate facts and figures on his fringe costs and on fringe practices in other companies.

Fringe benefits must be treated as a major and serious problem in union negotiations. They deserve as much negotiation attention and concern as do wage rates and the guaranteed annual wage program.

End *(Resume reading on page 63)*

Who's Looking After the Diet Shopper?

Sell her—keep selling her with your SUCARYL® sweetened line

She can't (or shouldn't) take sugar-sweetened products!
She knows SUCARYL*—she's used it in her home.*
She'll buy—actually shop for—your SUCARYL*-sweetened line.*

It's about time someone got around to the diet shopper. She wants one thing—*sweetness without calories*—and she'll go blocks out of her way to get it. Give her a product sweetened with SUCARYL, and you'll grab one of the livest new markets in the country.

SUCARYL, you know, provides sweetness—real, clean, sugar-like sweetness—without the bitterness or clinging, sharp taste of other synthetic sweeteners. It's a different substance entirely—Cyclamate—and it will hold up throughout your entire processing operation. With SUCARYL, your product can become a valuable adjunct to a properly-controlled diet.

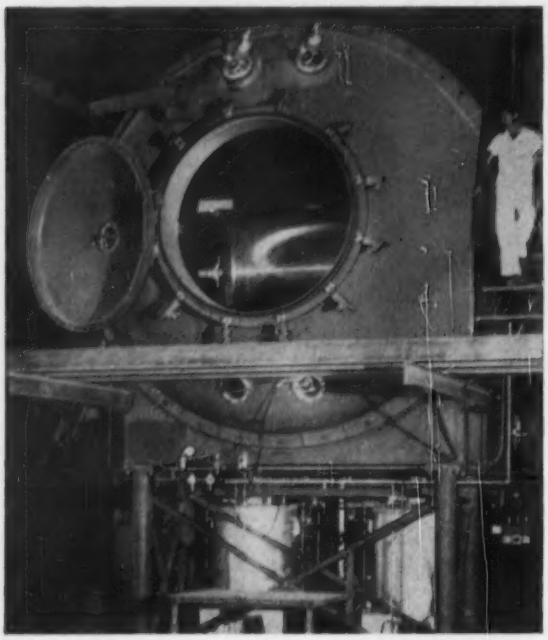
We've written a book about SUCARYL, especially for you. Tells you all you need to know about getting in the market. Drop us a line. But do it quick. The market is new, and now is the time to get your brand established.

Write: Chemical Sales Division,
Abbott Laboratories, North Chicago. Abbott

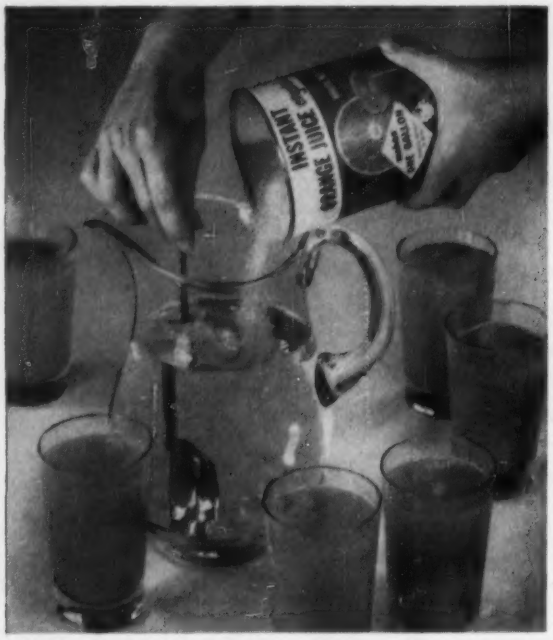
®Cyclamate, Abbott

For more information, use coupon on last page.

NEW PACKAGES & PRODUCTS



VACUUM-DRYER, only one of its kind, converts pure liquid orange juice into crystals in less than two minutes.



INSTANT CRYSTALS need no refrigeration, are lighter to ship and easier to store.

Introduce Citrus Dehydrate in Crystalline Form

Instant citrus juice in crystalline form, which went into its first commercial production last month, holds the promise of being food research's most recent gift to the citrus industry.

Perfected after years of research by both industry and the government, the new product requires no refrigeration, is lighter to ship, stores easily, and reconstitutes quickly in water. Flavor, appearance, and nutritional value are similar to fresh orange and grapefruit juice.

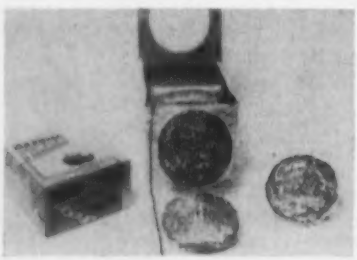
The problem of dehydration of citrus fruits has long been a thorn in the side of processors. Certain chemicals in the juices held water until excessive heat was applied, damaging flavor.

Engineers of Vacu-dry Co., an Oakland, Calif., processor of dehydrated deciduous fruits, discovered that a controlled quantity of heat applied under an extremely high vacuum for short and controlled periods of time, almost totally removed water. (FE Mar. 53, p. 49.) Problems of oxidation, flavor impairment, and storage were thus avoided.

Certain essential flavors are lost in any juice drying operation. It was found that these could be restored to the crystals by trapping them in a solid absorbing medium which was then reduced to crystalline form.

This absorbent was added to the citrus crystals in amounts of not more than 1% of the total. Then when water was added to the crystals, original essential oils and flavors were released. The continuous drying method also retained over 96% of the original Vitamin C content.

Orange Crystals, Inc., Plant City, Fla., holds exclusive rights to commercial production of orange and grapefruit juices using the new method. A $350,000 plant will insure an initial output of 2 million pounds of crystal annually, the equivalent of 15,000 fresh oranges hourly.



Suggestions for Packagers

Designed by Du Pont specialists, two new packaging ideas have been offered to food processors.

Frozen hamburger patties are packed in strip form with a convenient tear tape. Shown above are both six and twelve-patty cartons. The larger carton features windows for full product visibility.

The patties can be individually vacuum packed in cellophane laminated to polyethylene.

Complete ingredients for a tasty beef stew may be packed in a large tray holding a cellophane bag of mixed vegetables and a smaller tray of stew meat. A printed cellophane band inside the tray carried brand identification. The entire unit is overwrapped with cellophane.

New Outside...
RIEGEL INSIDE

The outer design of cereal packages is often restyled for fresh, new "appetite appeal"... but one part of the package has always stayed the same.

That is the Riegel inner liner... a waxed special glassine that through the years has proven its ability to protect vital taste and crispness.

More than 600 other Riegel Papers are now serving the nation's best-selling brands. In this wide selection you may find a better paper for your product... or we can "tailor-make" a new paper for you. Just tell us what you want paper to do. Write to Riegel Paper Corporation, P. O. Box 170, Grand Central Station, New York 17, N. Y.

Tailor-made Packaging Papers

Riegel

GLASSINES AND GREASEPROOFS

Plain • Waxed • Printed • Lacquer-Coated • Laminated

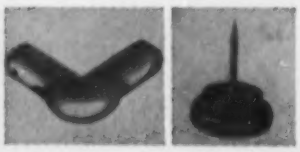
For more information, use coupon on last page.

DARNELL

CASTERS & WHEELS

REDUCE MATERIALS HANDLING COSTS!

Featuring Darnelloprene treads - a soft, resilient Neoprene rubber compound that has superior qualities in resistance to oils, waxes, most chemicals and oxidation - these casters offer ease of movement, quietness and protection for floors.



BUMPERS AND GLIDES

It will also pay you to look into the many ways that Darnell Rubber Bumpers and Noiseless Glides will increase efficiency and effect savings.

Free DARNELL MANUAL

DARNELL CORPORATION, LTD.
DOWNEY (LOS ANGELES COUNTY) CALIFORNIA
40 WALKER STREET, NEW YORK 13, NEW YORK
36 NORTH CLINTON STREET, CHICAGO 6, ILLINOIS

Italian Sausages in Sauce

Latest addition to the V. LaRosa & Sons, Inc., line of Italian-style food products is sauce with sausage links. Of the heat-and-eat variety, the product contains sausages of pure pork blended with spices. These are lightly browned before canning.

Packed in a 15½-oz. can, the sauce is ideal for spaghetti or macaroni.

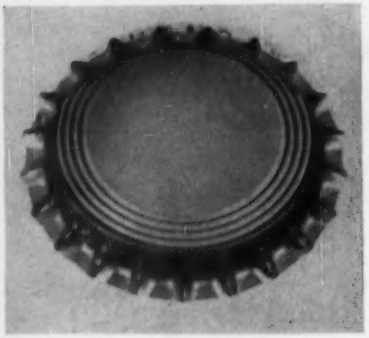
Juices for Baby

A new fruit juice product for babies is being packed in a useful and novel container by Clapp's Baby Foods. The juice is a new blend, of oranges and apples processed in juice form. The container is a standard 4-oz. baby bottle. All the mother need do is remove the cap, place a nipple on the bottle, and she's ready to feed the baby.

The juice was developed by Clapp's in an effort to find a nutritional product for babies without the high acidity and indigestible peel oil present in the single strength juices previously marketed.

The juice is processed in two varieties. The bottle with the blue label is for normal daily use. The one with the red label has prune juice added and is for use when a gentle laxative is required.

The juices are guaranteed to contain 50 milligrams of C per 100 cc when used.



Plastic Lined Crowns

Bond Crown and Cork Division of Continental Can Co. has introduced a plastic lined bottle cap. A mixture of vinyl resins, inert fillers, and a plasticizer, the lining can be molded and cured in conventional crown shells made from tinplate and is adaptable to high speed production lines.

The new liner offers three advantages: It is made of materials available in the U.S., eliminating dependence on a foreign source of supply; Properties are known so variations may be reduced; Appearance is more uniform than cork linings. (164A)

New Cup Lid

A transparent lid for paper food containers has been developed by Plax Corp., Hartford, Conn. (164B), in conjunction with the research departments of leading packagers.

Made of 10 mil Polyflex, Plax's oriented polystyrene sheeting, the lid is odorless, does not transmit taste, is dimensionally stable, and offers good product visibility.

Orientation by the special Plax process is reported to overcome the brittleness normally associated with pure polystyrene. The temperature range of the new lid makes it adaptable to both freezer storage and heat processing used for foods in waxed containers.

The lid has a high gloss and may be printed by the analine, silk screen, or hot stamp processes and embossed during forming. The coverall forms a primary seal with the cup's bead offering a sanitary seal.

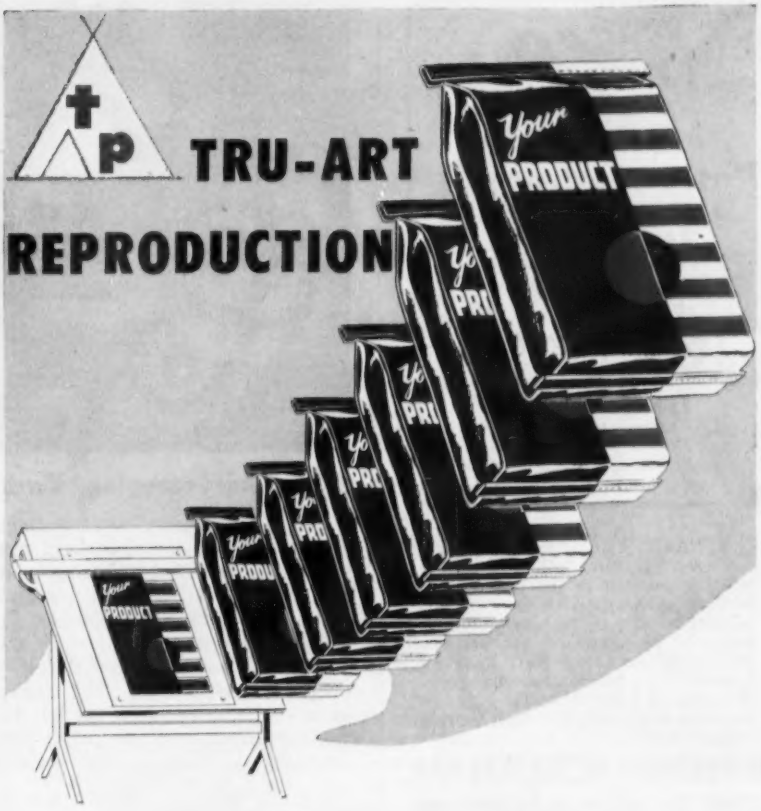
Polyflex lids are being manufactured by Dixie Cup Co. in 8, 12, and 16-oz. sizes.

New Carton, Trademark

Little Bo-Pizzas, the recently marketed miniature pizza pies, are now packed in a color 8-unit carton. The quick frozen product also features a new trademark—a carton of an aproned shepherdess. Processor is Petite Foods Corp. of Brooklyn, N. Y.

Another Can Clamp

Industrial Manufacturing Services Corp., Los Angeles, is marketing a clamp which will combine cans in units of four, six, or more. Specially recommended for canned beer, the clamps are called Pak-Lok.



For Volume Bag Users Who Want Something Better

Tru-Art means just that. Your artwork reproduced faithfully, just as the artist intended. No fuzzy register. No straying from color. Thomas Phillips maintains their own expert platemakers and printers to assure you the finest reproduction possible — T-P Tru-Art.

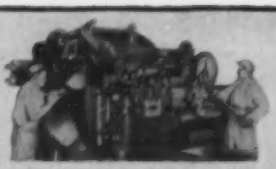
For quality bag production right down the line, add the name Thomas Phillips — a wholly integrated manufacturer of single, double or multiwall bags in all sizes and types, from the pulp to finished product — to your supplier list now. Write for fully illustrated booklet of T-P Products and Services.

ARTWORK SAMPLES

Thomas Phillips maintains a full staff of artists who work exclusively in bag design. If you are thinking of redesigning your package why not ask these experts to develop an attention-getting, bright, refreshingly new design especially for you?

COMPANY
AKRON, OHIO

For more information, use coupon on last page.



"THIS LUBRICANT INCREASED BEARING LIFE FROM 2 WEEKS TO 2 YEARS"

—says THE GLOBE COMPANY

"Animal acids and moisture, most harmful to ball and roller bearings prevails in the entire meat packing industry. With conventional lubricants, some of the bearings in our Roto-Cut machines did not last two weeks. Since using Ball Bearing LUBRIPLATE in machines operating continuously 24 hours a day for over two years, we have not had a single bearing replacement."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose... LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

Algebraic Seasoning, Carbonated Drink Powder Debut

Large-Charge, Inc., Tarpon Springs, Fla., has introduced two novel new products. One is a seasoning compounded according to an algebraic formula; the other is a powder for making carbonated non-caloric drinks.

Happy Seasoning is packed in two sizes, 1¾ and 5 ounces. The smaller jar has a polyethylene shaker lid. Ingredients are salt, MSG, sugar, pure celery, garlic, onion and paprika flavors, pepper, aminos, and other spices. The recipe for the seasoning was developed algebraically by the processor when the taste method of blending proved unsatisfactory.

Pop is a powder that need only be added to water to produce a carbonated, non-caloric drink. Processed in root beer, grape, and raspberry, the product is packed in small foil packets, holding powder for one 8 oz. glass.

New Product Combines Apple Sauce, Raspberries

A blend of strained red raspberries and fancy apple sauce, Appleberry Sauce is being marketed in metropolitan areas. Taste of the product is similar to plain apple sauce, but is enhanced by the tangy berry flavor.

Processor of the new product is Appleberry Corp., Baltimore. Label for the can is black, with product information and brand identification in green, red, white and yellow.

Par-Cooked Rice

River Brand Rice Mills, New York, has introduced par-cooked rice under the Aunt Caroline label. The rice is the long grain variety prepared by a process that retains most of the vitamins and nutrients, particularly Vitamin B.

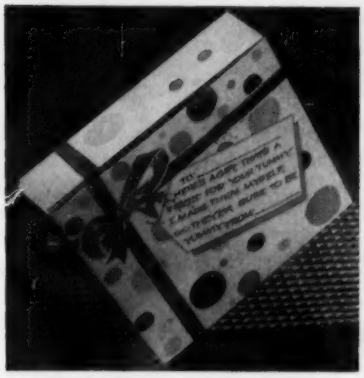
Correction

In our item "Canned French Dessert" (FE Jan., p. 162) it was erroneously reported that cans for the product were made by Continental Can Co., whereas American Can Co. is the manufacturer.

Big Six Become Seven

A seventh flavor has been added to General Foods' Jell-O desert line. The new desert is apple-flavored and was specially developed to provide taste appeal in salads.

Package for the new product is the standard Jell-O carton, with the addition of the phrases "a sensation for salads" and "imitation apple flavor".



Reversible Carton

Waxed cartons used for packaging Best Foods' Nucoa margarine are now printed on both sides in a novel packaging idea. When offered for sale, the cartons show the standard label and product data. When purchased and unpacked by the consumer, the carton may be turned inside out to provide a colorful box for packing cookies. The reverse side is decorated with a gift card, making carton ideal for holiday cookies.

All-Beef Sausage

Armour and Company is processing an all beef sausage product with a distinctive sugar cured and hardwood smoke flavor. Packed in 1-lb., cellophane-wrapped rolls, the product provides three to four servings.

The new product is cooked like pork sausage, but has a higher percentage of lean meat.

YOU CAN TELL A HAYSSEN-WRAPPED PACKAGE BY THE WRAPPING IT KEEPS!

easy, automatic operation

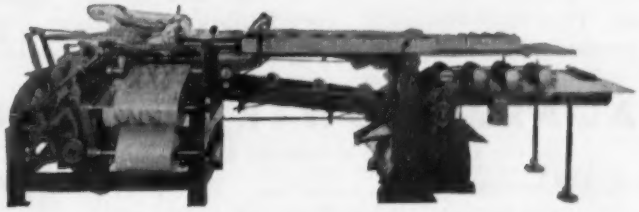
Regardless of size or shape, you get a neat, tight wrap on every package with a Hayssen automatic wrapping machine. *Wrapping's easier!* Also, production men report savings up to 80% over previous wrapping costs.

simple to adjust

No complicated adjustments from size-to-size on a Hayssen. No gears or sprockets to remove or change . . . no need for expensive mechanics to change size, either. So simple the operator does it on the job.

more sturdily built

Hayssen's simple, rugged design, using fewer moving parts, keeps these machines working and saving through years of dependable, trouble-free service. Every moving part is in the open and easily reached for maintenance and cleaning.



Since 1910, manufacturers *exclusively* of automatic wrapping machines for textiles, paper, frozen foods, meats, vegetables, and many other products. Whatever your product, Hayssen can solve your wrapping problem. WRITE today for more information.

Hayssen MFG. COMPANY

Dept. FE-2, SHEBOYGAN, WISCONSIN

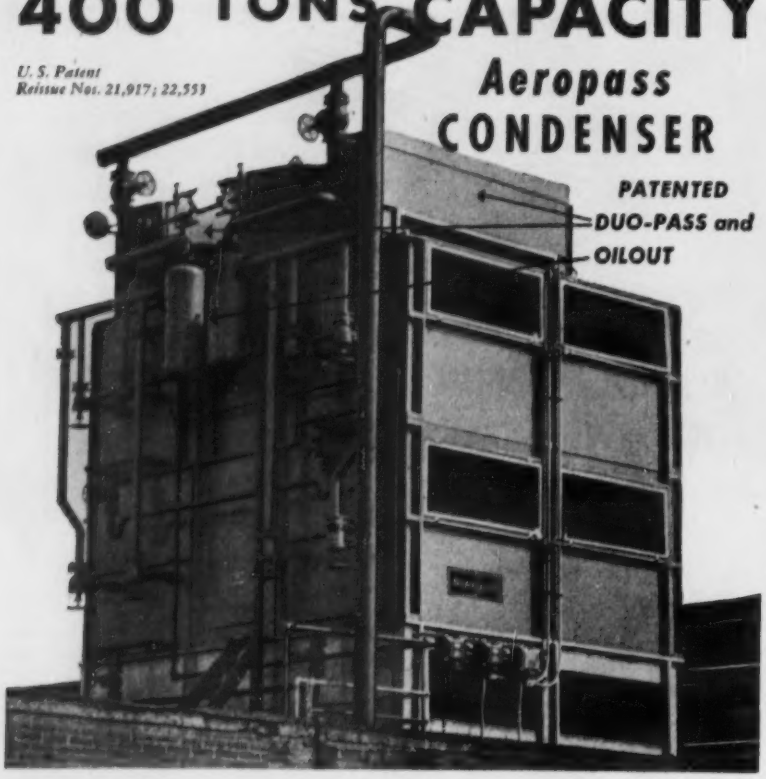
Atlanta • Boston • Chicago • Dallas • Denver • Detroit • Los Angeles • Minneapolis
New York • Philadelphia • St. Louis • San Francisco • Seattle • Montreal • Toronto

400 TONS CAPACITY

U. S. Patent Reissue Nos. 21,917; 22,553

***Aeropass* CONDENSER**

PATENTED DUO-PASS and OILOUT



YOU USE LESS POWER...

SAVE CONDENSER WATER...

SAVE UPKEEP COST

For large refrigeration systems, NIAGARA gives you a choice between a battery of condensers (that may be cut on or off with the load) or a high capacity condenser that saves space.

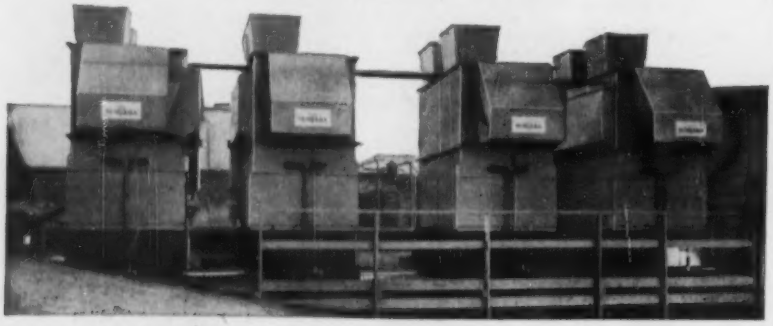
Both have the patented "Duo-Pass" and "Oilout" that remove superheat and keep the system free of oil. Results: you save one-third or more of power cost and upkeep expense. Niagara Patented Balanced Wet Bulb Control gives lowest head pressure operation automatically. ***Write for Bulletin 111.***

NIAGARA BLOWER COMPANY

Over 35 Years' Service in Industrial Air Engineering

Dept. FI, 405 Lexington Ave. New York 17, N. Y.

Field Engineers in Principal Cities of U. S. and Canada



Streamlined Handling

—*Continued from page 82*

this point that inspectors trim the tips of the ears.

The layout at Goodhue Cannery is not entirely original. It incorporates a number of ideas which started in other canneries. For example, the dock arrangement is similar to the system used by a few of the canneries in Wisconsin and Minnesota. Goodhue Canning Co. has, however, succeeded in integrating numerous innovations into one system that provides fast continuous flow of corn from dock to can.

The plant layout, including the arrangement of the conveyors and their coordination with the processing equipment was developed by Link-Belt Co., in close cooperation with Mr. Steve Lange, secretary-treasurer of Goodhue Co.

End (Resume reading on page 83)

Long John Donuts

—*Continued from page 113*

at both ends to square off the dough edges.

Dough then is sliced by a half-circular cam-actuated knife that makes only a 1-in. turn just inside the slit. Pressure-extruded dough pieces then drop onto traveling screens, which are synchronized with the speed of the cutters.

Controlled Weight

Formerly, weight of dough pieces was controlled by hand-regulating air pressure with the aid of two valves, one for each hopper. But air pressure built up so rapidly in the hoppers that the operator had to devote much time to releasing excess air.

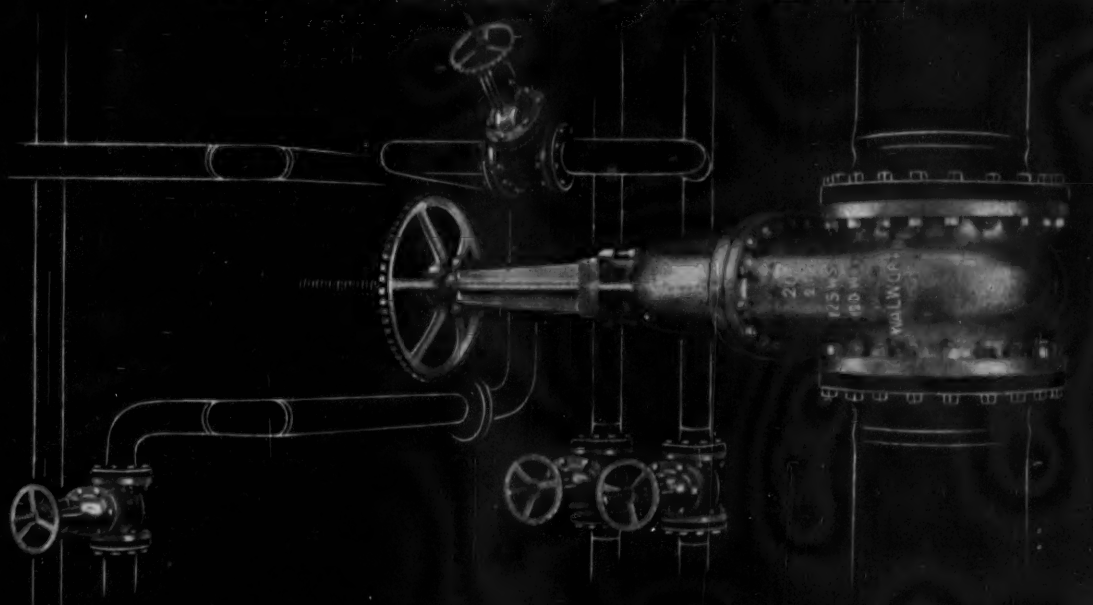
Now we've conquered this problem by installing an automatic system for regulating air pressure in both hoppers.

Once the pressure is preset on the dials, mercoid switches—one hooked to each hopper—take over and actuate solenoid valves that release the extra air pressure, thus constantly maintaining it on the 40-psi. button.

Not only have we achieved weight uniformity with our automatic air-pressure control system, but we've also been able to produce an average of 17 dozen more Bismarcks or round donuts for each dough-batch fed to cutter hoppers. Previously, the excess air in the hoppers had caused more dough to be deposited than desired.

End (Resume reading on page 114)

WALWORTH



IRON BODY WEDGE GATE VALVES

Walworth No. 726F OS&Y (Outside Screw and Yoke) Iron Body Wedge Gate Valve. OS&Y valves are recommended for services where it is desirable that the line fluid does not come in contact with the stem threads. Note the swing-type gland-eye-bolts for easy repacking. Sizes 2 to 30 inches.

Better because ...**The entire valve, from handwheel to seat rings, is ruggedly constructed to withstand rough and frequent usage. Body, bonnet, and yoke are sturdy castings with large radius fillets. Dimensions and drilling of end flanges are in agreement with American Cast Iron Flange Standards. Stiffening ribs connect end flanges with the body neck to maintain a rigid connection with piping.**

A wide range of Walworth Iron Body Wedge Gate Valves is available—through your Walworth Distributor—from which you can choose the right type to meet your most exacting conditions. Saddle-type valves as small as ¼-inch; low pressure valves for water and gas pipelines up to 36 inches.

Whenever you need valves and fittings, choose from complete lines—in a variety of metals—manufactured by Walworth. For more information, see your Walworth Distributor or write: Walworth Company, General Offices, 60 East 42nd Street, New York 17, N. Y.

WALWORTH

Manufacturers since 1842

valves . . . pipe fittings . . . pipe wrenches

60 East 42nd Street, New York 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

For more information, use coupon on last page.

ENDS DOWN-TIME LOSSES

Bausch & Lomb *"Abbe-56"*

America's most widely used all-purpose refractometer

Always *dependable* for faster, easier readings—accurate to ± .0001—of any liquid or solid in the 1.30 to 1.71 index range. Job-proved record of longer life, less interrupted service than any other Abbe-type instrument.

Here's why! Streamlined housing protects scale and internal parts from dust, dirt, fumes, liquids. Special prism cement—cannot be harmed by food acids or organic compounds. No time lost for prism surface reconditioning—spare prism set (optional), readily interchangeable *by user.*

Always on the job! That's why it's far and away America's Number One choice.

Free demonstration! Try it yourself, in your own laboratory. See how much time and effort you save in getting dependably accurate readings . . . year in, year out. Absolutely no obligation.

WRITE for Catalog D-202 and a demonstration. Bausch & Lomb Optical Co., 60338 St. Paul St., Rochester 2, N. Y.

BAUSCH & LOMB
SINCE 1853

"Abbe-56" **REFRACTOMETER**

ADVANCES IN TECHNOLOGY

Soluble Coffee Process

Acid hydrolysis of previously extracted coffee grounds to increase soluble solids content of final dried product is basis of a recently patented process for manufacture of soluble coffee.

Roasted, freshly ground coffee is extracted with water to produce a concentrate. Then part of the grounds are hydrolyzed with phosphoric acid solution (pH 1.5-2) to remove additional soluble solids.

Solution is separated from spent grounds, partially neutralized with strongly basic Ca or Mg compound, filtered, further neutralized with essentially neutral Ca or Mg compound, again filtered, and purified.

Essentially tasteless solution is concentrated, mixed with coffee extract and the mixture dried—*U. S. Patent* 2,687,355.

Ultrasonics Cuts Conching Time

Treatment of chocolate with sound waves can accelerate some of the changes that occur during conching.

Removal of moisture and volatile acids is not affected, but astringent character of tannins is modified, flavors are blended, and latent flavor development, one of the most desirable effects of conching, is improved.

A typical time-temperature curve will show a pronounced peak, followed by a quick drop, on the third day of conching. With an ultrasonator this temperature peak will occur the first day, with the same flavor-producing effects.

There is a "field" of temperature which should be used with ultrasonic treatment. For example, with a flow through rate of 1,320 lb./hr., temperatures should be between 123 and 165 F.; at 195 F. an effect resembling over-roasted cacao beans is obtained.

Cocoa preparations are quickly brought to a pleasant chocolate flavor by the use of ultra-sound which seems to exert its effect by greater oxidation activity coupled with the thousands of atmospheres of pressure momentarily produced by the high vibration rate. For the same daily ouput, an ultrasonic concher takes up less than ⅓rd the space, uses 1/80th the power and requires about ½ the investment in building and equipment of a conventional conching operation—*International Chocolate Review*, 309-11, Oct. 1954.

Improved Curing Process

A new method for curing meat which enables both processing material and smoke to penetrate deeply and quickly is the basis for a recently issued patent.

Method comprises forming multiple artificial pores in chilled green meat, then spreading water-soluble processing material over the surface. Meat is maintained in chilled condition to enable processing material to dissolve in liquid from meat and diffuse into it. This is followed by smoking and partial drying. Latter produces shrinkage that seals in smoke and curing material—*U. S. Patent* 2,688,555.

Accurate Bromate Test

The amperometric titration method for detection of iodine end point increases recovery and improves reproducibility of bromate determination in flour.

Both the Armstrong and Howe methods show large errors at low concentrations of bromate due to the difficulty of recognizing the end point, and low-grade flours have given trouble because the color of the extracts masked the end point.

The improved method is based on the extraction and reaction procedures of Armstrong combined with the amperometric titration of Knowles and Lowden. Details of the apparatus and method are given.

The authors report an average recovery of 97.98% which is higher than other reported recoveries. Standard errors of plus or minus 0.15 ppm. are obtained with flour containing 5-15 ppm. of bromate, the errors rising to plus or minus 0.37 ppm. at levels of 30-40 ppm—*Cereal Chemistry*, 517-21, Nov. 1954.

Meat Perforating Press

An apparatus for preparing meat for curing by simultaneously perforating and compressing it has been recently patented.

Unit comprises a horizontal platform on which meat is placed, a vertically movable head with vertical perforating elements, compressing and stripping means, upper and lower stops.

Upward and downward movement of head is by air-operated cylinder mounted on top of units frame—*U. S. Patent* 2,688,151.

Crab Meat Keeps Longer Canned Under Vacuum

Shelf life of dry crab meat stored at 40 F. may be increased as much as 40% by canning under high vacuum.

This was determined by experiments conducted in Ketchikan, Alaska to obtain data on keeping quality of fresh dungeness crab meat at temperature of 32 F. or above prior to freezing, or after thawing.

Organoleptic tests, chemical determinations, total bacterial counts were made to follow course of spoilage. The organoleptic tests indicated that storage life of the vacuum-packed dry meat was 7 days at 40 F., while the atmospheric-pressure-canned product had an acceptable storage life of only 4 days.

It was also observed that changes in quality were not detected organoleptically until 2-3 days following a significant increase in number of bacteria—*Commercial Fisheries Review*, 20-21, Nov. 1954.

Stabilized Peanut Butter

Preparing peanut butter with softness and spreadability over a wide range of temperatures is the object of a recently patented process.

Method comprises comminuting mass of peanuts, adding stabilizer, and determining plastic range of mixture. Then mass is subjected to disruptive agitation as it is cooled to a temperature just below the lowest point in the plastic range. It is then heated, with continued agitation, to just below the highest temperature in plastic range.

This treatment is said to totally crystallize the fat at all temperatures below upper limit of plastic range—*U. S. Patent* 2,688,554.

CS_2 As a Fumigant

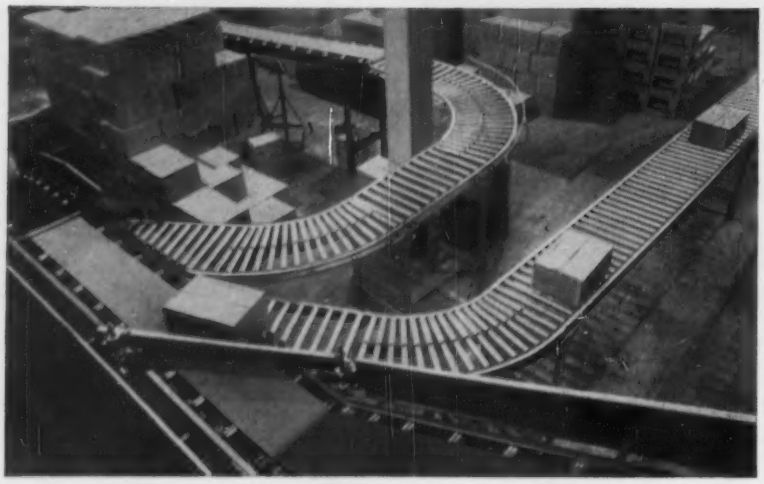
Where moistures are high and elaborate means of airing grain to remove fumigants are not available, CS_2 has the advantage that its sorption is lower than that of other widely used

"doodles" or complete plans?

Whichever you have

Standard's complete conveyor service

can save you money!



Many a complex conveying problem has been solved by Standard engineers with only a customer's "doodle" drawing to follow. And often when complete plans are submitted, Standard engineers make recommendations that improve the conveyor application . . . save time and money as well.

If you prefer to do your own conveyor planning, we suggest you send for Bulletin 63-D. Here in 28 fast-reading pages you get all the specifications, drawing and application data on a wide range of Standard Conveyors. This includes gravity and power conveyors and accessory equipment: Handidrive pre-built conveyor units and the complete, self-contained portable conveyor units listed below.

Call your Standard Conveyor representative listed in your classified phone book — or send for copy of Standard General Catalog — address Dept. FE-25

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minnesota
Sales and Service in Principal Cities

Nearly 50 years of conveyor experience

Standard

GRAVITY & POWER Conveyors
ROLLER • SLAT • WHEEL
SECTIONAL • BELT • CHAIN • PUSH-BAR
PORTABLE CONVEYOR UNITS:
HANDIBELT • INCLINEBELT • EXTENDOVEYOR • UTILITY BELT-VEYOR
HANDIPILER • LEVEL BELT • LITEWATE • HANDIDRIVE
PNEUMATIC TUBE SYSTEMS

agents, and more of it is recoverable.

The Q_s/Q_f ratios (mg. adsorbed by 100g. of grain per 100 mg. of fumigant used) of 8.8, 2.4, 0.3, and 0.2 respectively for HCN, CH_3, CH_2O, CH_3Br, and CS_2 express this. An increase of wheat moisture from 13-18% more than doubles total sorption of CS_2 and the amount of it bound to the grain.

Ready desorption of CS_2 and fact that its sorption is largely physical, and therefore reversible and little affected by temperature, reduces risk of taint and loss of viability, and make it an advantageous fumigant for use in tropical climates—*Journal of the Science of Food & Agriculture*, 536-41, Nov. 1954.

Beer Foam Quality

Using the foam-life method of the author for measuring stability of beer foam, hopping rates of 0.26-2.6 lb. per bbl. of 8 deg. and 12 deg. Plato wort increased foam life, and decreased surface tension of the wort. Peptone solutions behaved similarly on hop additions.

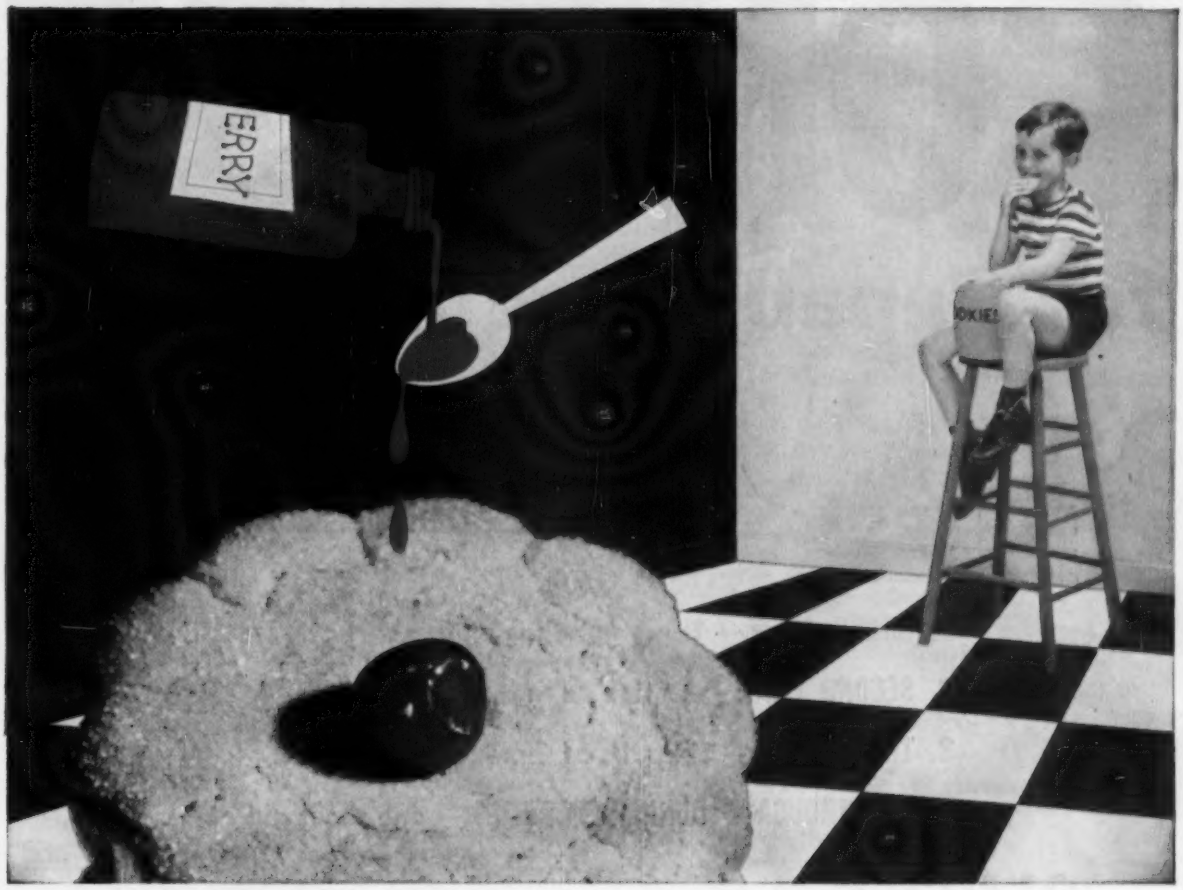
When the soft resins, lupulone, and humulone of hops were added to peptone solutions the foam life was shortened. On boiling, however, the foam life of the solution containing humulone was increased, suggesting that iso-humulone formed by boiling is the active agent of hops in improving beer foam, while other constituents act as antifoarms.

Effects of hop constituents in changing surface tension seems insufficient to explain improvement they cause in foam quality. Surface viscosity increases due to hop additions are very marked, however, and increase with time, while unhopped solutions show practically no change of surface viscosity with time. This change in the toughness of the surface membrane of hopped solutions seems to be responsible for their improved foaming powers—*Internaal Tijdschrift voor Brouwerij en Mouterij*, Vol. 13, Nos. 9/10, 131-138, 1953-54. (In Dutch.)

Eradicating Insects In Packaged Foods

Treatment with cathode rays has been found effective in controlling insect infestation of certain packaged military rations composed of cereals and fruits.

Five species of insects that normally infest cereal and fruit products were used in the experiments. Gamma, cathode, and X-rays were applied in



make your flavors, extracts better with

DOW PROPYLENE GLYCOL, U.S.P.

High solvent action and efficiency over a broader range of flavoring materials—two very important reasons why Dow propylene glycol, U.S.P., is gaining widespread acceptance as a solvent for food flavors and extracts. To these add economy in manufacture, made possible for many by propylene glycol, and you now have three, excellent advantages that merit your own investigation of this versatile solvent.

Food colors, emulsified flavors and flavor concentrates benefit, too, from propylene glycol's good solvent action. Many makers of food colors have substituted propylene glycol for other solvents with only slight alteration in formula and remarkable savings. A big advantage in formulating emulsified flavors is gained by the wetting action of propylene glycol which increases the stability of these emulsions.

Can Dow propylene glycol, U.S.P., improve your product? We'll send a free sample and property information to help you decide this in your laboratory. Write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. OC-826E-1.

you can depend on DOW CHEMICALS

For more information, use coupon on last page.

CONTEST

for Capable Engineers only

Guess the name of this manufacturer of vacuum equipment

PRIZES:

1. **GRAND PRIZE** — Trip around the universe.
2. **SECOND PRIZE** — Option on the Brooklyn Bridge.
3. **THIRD PRIZE** — Six pairs of three-legged overalls.
4. **ONE THOUSAND RUNNER-UP PRIZES** — one thousand ouija boards.

CLUES:

1. Company founded in 1917.
2. Both original founders still active in the business.
3. Each founder has a son thoroughly trained in engineering who is also active in the business.
4. The company has specialized in jet vacuum equipment more than any one firm.
5. Has made hundreds of jet cooling units in capacities up to 3000 tons of refrigeration.
6. Makes an extensive line of other jet equipment including jet mixers, jet heaters, jet absorbers, jet pumps, and jet fume scrubbers.
7. Has designed and built thousands of barometric condensers in standard and a great variety of special materials.

Why, of course it's

CROLL-REYNOLDS CO., INC.

CHILLVACTOR UNITS • EVACTOR STEAM JETS • CONDENSING EQUIPMENT

Main Office — 751 Central Ave., Westfield, New Jersey Phone Westfield 2-4200
New York Office — 17 John Street, New York 38, N. Y. Phone Cortlandt 7-5531

various doses, not only to see whether the insects could be killed, but also whether the packaging material or flavor of the food would be adversely affected.

Detailed specifications have been set up for a process of insect eradication by ionizing radiations, with a conservative cost analysis and due consideration of radiological safety aspects of such a process—*Food Technology*, 536-40, Dec. 1954.

Determining Melting Point of Cocoa Butter

Cooling melted cocoa butter to 32 or 50 F. commonly practiced for melting point determinations, is the least favorable condition for stabilization. Either higher (74 F.) or lower temperatures (0 F.) lead to more rapid stabilization of the fat.

Most effective way of preparing fat is to solidify it at room temperature for 1 hr., then hold it in an incubator at 75 F. overnight. Samples held at 74 F. overnight melted at 91-92 F., while holding them at 32 F. for 1-14 days gave melting points of 80 deg.

Capillary tube methods of determining melting points is uncertain since the column of fat may move upward in the tube before it is completely clear. The "mercury method" in which scrapings of the fat rest on mercury in a crucible during the heating is more certain. Thermometer with bulb immersed in the mercury registers temperature at which fat softens and collapses.

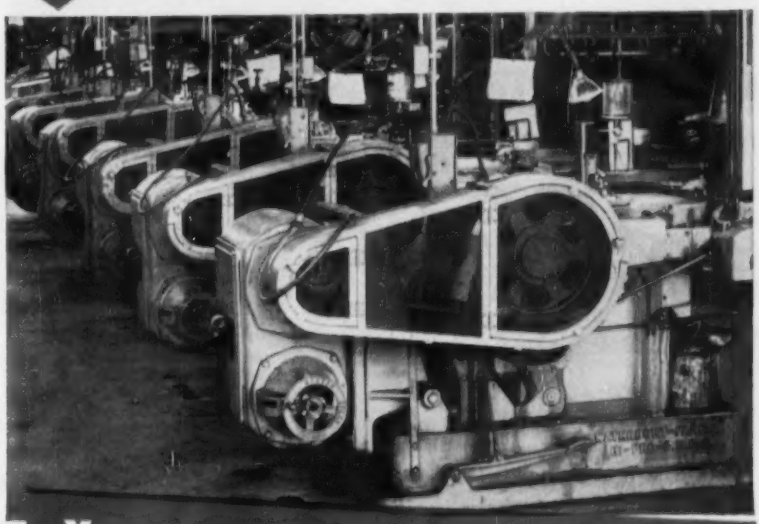
This is the "incipient melting point"; the complete melting point is taken as the temperature at which the fat droplets are entirely clear, and free of opalescence—*The International Chocolate Review*, Vol. 9, No. 6, 161-64, June, 1954.

Glucose Increases Yield Of Vinegar Generators

Studies in a laboratory vinegar generator made of a Pyrex glass tube 6 in. dia. x 59 in. high, charged with beechwood shavings and innoculated with *Acetobacter xylinum*, indicated that maximum acetification occurs only if glucose sugar is present in the mash fed to the generator.

Neither maltose, sucrose, nor invert sugar syrups gave as good results as glucose. A glucose concentration of 0.5-0.7 g./l. is required, and yield falls off rapidly if concentration falls below 0.1g. Other nutrients required per l. for optimum production were: Ammonium ions, 20 mg., phosphate

REEVES Vari-Speed Motodrives provide the exact speeds required for maximum production and efficiency on this bank of six Waterbury-Farrel cold heading machine installation in the P. R. Mallory plant in Indianapolis.



Your machines will produce more at less cost with—

REEVES

Variable Speed Control

● Whether your production problems involve manual or *automatic operation* . . . REEVES complete line of Variable Speed Drives and Controls will deliver the exact speed required for each operation, each operator, under every changing condition of method or material. REEVES Speed Control is positive and accurate to a fraction of an RPM.

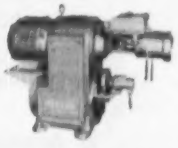
Let a REEVES Speed Control Engineer show you how you can make your machines . . . your operations . . . more efficient, more economical, more profitable—*now!* Write today for complete details. Specify FE16-L.

Only REEVES offers you a complete line of Variable Speed Drives and Automatic Controls!

MOTODRIVE combines motor, speed varying mechanism and reduction gears in single, compact unit. Speed variations 2:1 to 6:1. Sizes to 40 hp. Also available in fractional sizes with 10:1 ratio.

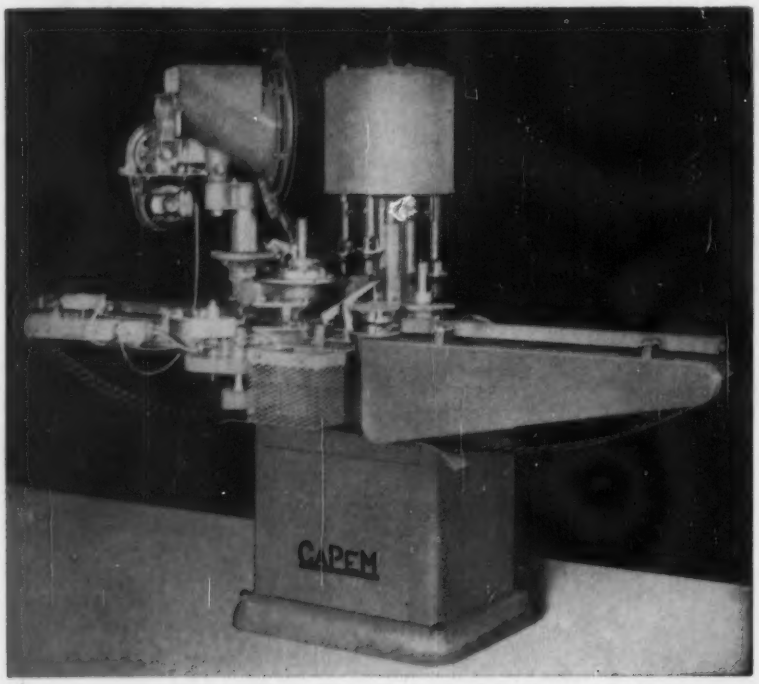
VARI-SPEED MOTOR PULLEY converts any constant speed motor to an accurate, variable speed drive with 4:1 ratio. Rugged, dependable—Sizes to 15 hp. VARI-SPEED JR. available for light machinery.

VARIABLE SPEED TRANSMISSION for providing infinite, accurate speed flexibility over a wide range—2:1 to 16:1. Especially adaptable for heavy duty application. Fractional to 87 hp.



AUTO-PNEUMATIC CONTROL with linear output speeds is but one of a complete line of automatic controls designed and engineered to operate your machines more efficiently, more profitably, automatically.

REEVES PULLEY COMPANY • COLUMBUS, INDIANA



CAPEM

THE MODERN SCREW CAPPER

- Applies any type of standard screw cap or cover at speeds of 2000 to 10,000 per hour.
- Takes container from conveyor line, applies cap perfectly, and returns container to conveyor AUTOMATICALLY without intermediate handling.
- Handles bottles, jars, cans or jugs of any size or shape.
- Delivers a perfect, LEAKPROOF seal at low cost.
- Available in 1, 2, 4, 6 and 8 spindle models.

Write for prices and delivery.

CONSOLIDATED PACKAGING MACHINERY CORP.
BUFFALO 13, N.Y.

ions, 120 mg., magnesium ions, 5 mg., potassium ions, 15 mg.

When these results were applied to generators in a commercial vinegar plant, it was found that at first it made little difference whether glucose was present or not. From a study of the reducing substances in these generators, however, it appears that in the absence of glucose, *Acetobacter* bacteria are able to transform part of the alcohol fed to them into pyruvic acid, at the expense of acetification, since the yield of acetic acid in these generators is lower than in generators to which glucose is fed.

Presence of some CO_2 in the exit gases is also characteristic of generators not receiving glucose. By adding glucose to the mash the acetic yield improves, and release of CO_2 is halted. Value of ammonium salts, phosphates, magnesium and potash in vinegar mashes was confirmed in the larger generators—*Fermentatio*, No. 5, 190-202. (In French.)

Solubility of Second Solute Effects Sugar Crystals

Crystallization rate and degree, both in sugar liquors and in syrups, jams, jellies, honey, and confectionary is greatly influenced by the presence of other solutes. Inorganic salts—KCl, NaCl, $MgSO_4$, $CaCl_2$, NH_4NO_3, CdI, and $CuSO_4$,—as well as glucose and fructose were used in sucrose-water solutions to furnish data for ternary phase diagrams. Water-hexose-inorganic salt, and water-glucose-fructose systems were also studied by determining composition of equilibrium solution when one or both solid components was present in excessive quantities.

In a sucrose-water-inorganic salt system, sucrose crystallizes out as the solid phase when the solution's composition is near the sucrose corner of the ternary diagram, and continues until the composition reaches the invariant point (I.P.) which is the lower limit of "purity" for sucrose crystallization.

Comparison of solution composition at the I.P. indicates that solubility of second solute has more effect on amount of sucrose present than any other single factor. Solutes of low water solubility give I.P. solutions of high sucrose content and vice versa. Limiting concentration of sucrose permitting crystallization is reached relatively quickly if the second solute is higher water soluble.

In presence of fructose, the I.P. solution contained much less sucrose than when glucose was the second solute. In hexose-inorganic salt

"Naturally," Food Sells Better...

When You Sell

NATURAL FRESH FLAVOR

intensified by Zest®

ZEST brings out the true garden-fresh flavor that nature put *into* your vegetables . . . prevents the gradual "flavor-fading" that may be robbing your brand of profit-making taste appeal. Step up quality with fuller flavor. Add ZEST, Staley's 99+% pure monosodium glutamate, to your canned and frozen vegetables, soups, fish, stews, poultry . . . and scores of other foods.

ZEST intensifies natural flavor *already in* your foods without adding flavor, aroma or color of its own. Freezing reduces the level of amino acids. ZEST restores this loss. ZEST is effective in tiny amounts either before, during or after processing. After using ZEST, food processors instantly notice a marked flavor improvement. Write today for all the details about the seasoning that makes foods sell better!

Zest®

PRODUCTS FROM CORN
Staley's

Staley's 99+% Pure Monosodium Glutamate

A. E. Staley Manufacturing Co., Decatur, Illinois

Mail this coupon for the complete ZEST story.

A. E. Staley Mfg. Co.
Dept. FE-2, Decatur, Illinois

Gentlemen: Send me all the facts about ZEST—the amazing seasoning that boosts natural food flavors.

*Name*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

For more information, use coupon on last page.

75 ways to serve tape

Wide tapes, narrow tapes—any of more than 300 different pressure-sensitive tapes can be applied faster, easier by dispensers designed specially for the job. 75 different manual, automatic and semi-automatic dispensers for "SCOTCH" Brand Tapes are now available—or our engineers will design one to fill your specific needs. For facts, write on your letterhead c/o Dept. FE-25.

DISPENSERS for more than 300 PRESSURE-SENSITIVE TAPES for industry, trademarked...

REG. U. S. PAT. OFF.

SCOTCH BRAND

The term "SCOTCH" and the plaid design are registered trademarks of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. General Export: 99 Park Ave., New York 16, N.Y. In Canada: P. O. Box 757 London, Ontario.

3M COMPANY

LOOK how dispensers can work for you!

QUICK SEALING of small cartons is accomplished with this "SCOTCH" Brand Type M Box Sealer. Uses ¼" to ⅝" tape widths. Object to be sealed is merely passed over roller automatically applying 1½" strip of tape.

COMBINE PACKAGES automatically with "SCOTCH" Brand Package Bundler S-69. Applies "SCOTCH" Brand Cellophane Tape in correct lengths to two packages at rate up to 75 "deals" per minute.

SPEED PRODUCE handling with "SCOTCH" Brand Bag Sealer No. P-35. Holds ½-inch or narrower rolls of "SCOTCH" Brand Tapes up to 72 yards in length—seals polyethylene vegetable and fruit bags with a simple, quick motion.

COMBINE OR SEAL cans with this "SCOTCH" Brand Can Bundler. Tapes two round-end cans together; may be used to seal covers on round containers. Uses transparent, colored, or printed "SCOTCH" Brand Tapes.

(KCl, NaCl) solutions, solubility of hexose is increased by the salt. At the I.P. such solutions contain less KCl in presence of fructose than with glucose present.

In glucose-fructose-water systems at 30 deg. C, there is an area in which glucose monohydrate is the solid phase. In honey the presence of fructose may lower the transition temperature of glucose to glucose monohydrate so that crystals of the latter could appear.—*Journal of Applied Chemistry*, 401-4, 405-8, 409-13, Sept. 1954.

Rapid Moisture Method For Doughs, Breads

An infrared procedure makes possible the determination of moisture in bread and dough in less than 10 min., in contrast to hours required by standard methods. Method involves pressing dough or bread sample between tared filter papers, followed by rapid drying between two infrared lamps, with the sample suspended from arm of a projection reading balance.

For doughs, tester lamps were set at 950w. and held stationary 7.6 cm. from the sample. Drying time for a 5g. sample was 3.5 min. Prolonged drying beyond this point gave no appreciable increase in moisture. Results compared favorably with those obtained by drying a 2g. sample for 5 hr. at 100 C. under a pressure of 25 mm. Hg.

Best procedure for bread comprised applying 950w. with bulbs retracting during the entire test period from a point 4.5 cm. from the sample. As soon as 30% moisture had been removed the bulbs were switched to 650w. for the remainder of the determination. Results compared favorably with those obtained with the vacuum oven method—*Cereal Chemistry*, 506-13, Nov. 1954.

Infection of Bakers' Yeast

Compressed yeast with its moist surface and high content of nutrients is readily infected by a large variety of microorganisms, most common of which is probably *Oidium lactis*.

It forms a white cottony growth over the surface, and is easily recognized under the microscope. No serious damage is caused, but if infection is heavy, surface spoilage and cheesy odors can occur.

Penicillia, mostly *P. glaucum*, will flourish on yeast, and make it unsalable because of discoloration and surface decay. *Mucor mucedo*, and *Fusarium* species are also found at

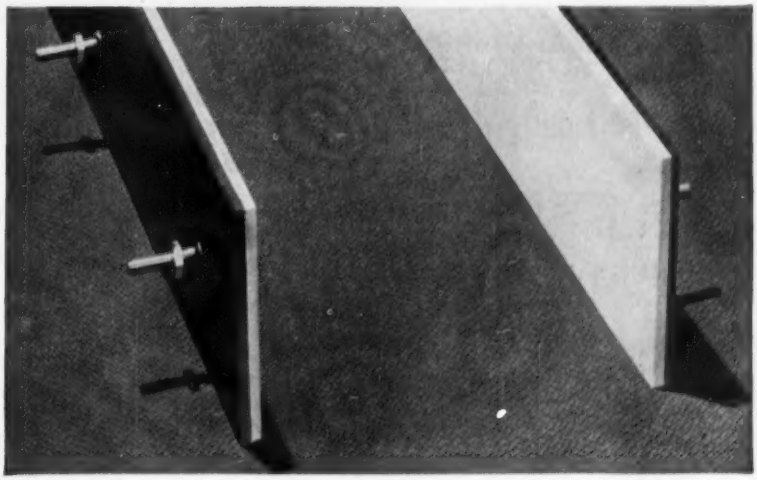
TEFLON aids food handling

conveyor guide-rails protect products and packages

● With TEFLON-faced guide rails on conveyors and packaging machines, handling spoilage is minimized, sanitation is simplified, packages do not become streaked or smeared.

Why? Because nothing sticks to TEFLON, the slipperiest material known. Chemically inert, having zero moisture absorption, tasteless, odorless — it prevents food contamination and is the easiest material to keep clean.

TEFLON-faced steel guide rails are fabricated by the United States Gasket Company in any length



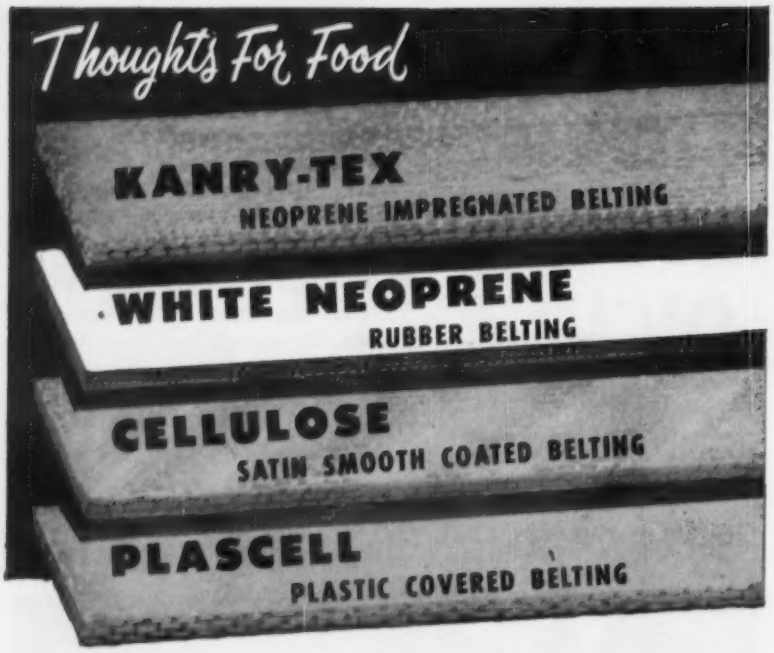
up to 12 feet and in widths from ½ in. to 2½ in. One-eighth inch thick duPont TEFLON is bonded on ⅛ in. steel bar leaving the surface unmarred by mechanical fasteners. Shot-welded studs on the metal side are provided at designated points for attaching to equipment. Special shape guide rails are also available to specifications.

Ask your Industrial Distributor or write for Bulletin No. GR-301.

UNITED STATES GASKET COMPANY
CAMDEN 1, NEW JERSEY

USG FABRICATORS OF FLUOROCARBONS & OTHER PLASTICS
Representatives in principal cities throughout the world

For more information, use coupon on last page.



each specifically developed for: CONVEYING INSPECTING SORTING

PROTECTED FROM
Odor Toxics Soil Taste Fiber Rot Deterioration

RESISTS ANY ABSORPTION
Acids Fats Juices Alkalis Oils Moisture

KANRY-TEX
Completely impregnated. Dense and tough — yet flexible enough even for small pulleys. May be sterilized with hot water or steam. Available in white or brown.

WHITE NEOPRENE
Completely constructed with highest grade neoprene rubber, finished with smooth 3/64" cover. Friction surfaced pulley side. Also available in black. White Ruff or brown Kling Top for incline and decline conveying. Brown friction surface for conveying and sorting.

CELLULOSE
Coated with opaque white or clear amber cellulose on both sides or on carrying side only. Smooth, to prevent clinging particles of food, etc. Washable with soap and water.

PLASCELL
Smooth white plastic surface that will not peel or flake. Easy to care for, can be brushed off, wiped with a damp cloth or cleansed with hot water. Also in green or maroon for simplified sorting, inspecting or sizing.

WRITE FOR COMPLETE BOOKLET
"GLOBE PRODUCTS FOR THE CANNING INDUSTRY"
Send for Test Samples — Write Dept. E

GLOBE WOVEN BELTING CO., INC.
1400 CLINTON STREET • BUFFALO 6, NEW YORK
KNOWN FOR QUALITY THE WORLD OVER

Food Engineering Reports
LATEST TECHNICAL NEWS
In Keeping Up With Field. . . . page 199

times. Bright red spots on the surface indicate infection by red-pigmented yeasts, while chalky white spots are probably colonies of a yeast-like fungus, *Monilia variabilis*. Rusts have been found on the surface of pressed yeast pounds, and with the black and brown *Aspergilli*, can give them a brown, or gray to black surface discoloration.

Molds are the most dangerous infection to pressed yeast cut into pounds. They are air-borne and only thorough filtration, rigid cleanliness, and use of mold-inhibiting wrappers will control them. Interior of a pound may sometimes be infected with protein-decomposing bacteria, or lactic acid formers which may contribute foul odors. *Pseudomonas fluorescens* will also infect yeast if water containing this sewage organism is used in the factory.

Bacterium listeri, the flocculating lactic acid rod is a very common organism in yeast factories where it can have its source in infected seed yeast, or in insufficiently clarified molasses. It induces clumping of the yeast toward the end of the fermentations, which interferes with assimilation of nutrients and hence gives poor yields. Both degree and deteriorating effects of these infections are likely to increase during warm weather — *Mitteilungen der Versuchsstation für das Gärungsgewerbe* (Vienna), Vol. 8. No. 7/8, 91-94. 1954.

Slow Cooling of Wort Gives Better Beer

Coolship storage, during which wort is cooled to 16 deg. R. before passage through a plate-type cooler to reduce it to 4.6 R before pitching with yeast, seems to exert a beneficial effect on beer quality.

Comparative experimental fermentations on two worts, one cooled immediately and filtered through diatomaceous earth, while the other remained in the coolship for 9 hr. before cooling and filtering, showed slightly lesser attenuation of the immediately filtered worts and pH figures during fermentation were a little lower. Finished beers did not differ much in chemical composition, but foaming power of immediately filtered wort beers was below that of the other beers. Coolship storage of the wort reduced the low molecular.

Sterwin offers "TRIPLE" SERVICE

to help the Food Industry produce better products

1

Products and Delivery

Most complete line of Vitamins, U.S.P., Vanillin, U.S.P., Certified F.D.&C. Colors. Any quantity—when you want them—where you want them. Quick delivery from branches in 11 cities covering the United States and Canada.

2

Research and Testing

Sterwin customers served by huge Sterling-Winthrop Research Institute . . . one of the world's largest research laboratories. Constantly working to improve existing products . . . and to originate new products and processes.

3

Technical Sales Service

"On the spot" service based on years of technical and practical experience. Supplemented by home office service staff and Sterwin Research.

TIME AND AGAIN Sterwin Service, Products and Research have enhanced a good product's salability by adding more taste-appeal, eye-appeal, health-appeal. Find out how Sterwin men, materials and methods can help you.

CONTACT YOUR STERWIN REPRESENTATIVE OR WRITE DIRECT TO:

BRANCH OFFICES & STOCKS CARRIED AT:
Atlanta, Buffalo, Dallas, Evanston, Ill., Kansas City, Mo., Los Angeles, Portland, Ore., St. Louis, San Francisco.
IN CANADA: Montreal, Toronto.

Sterwin Chemicals INC.

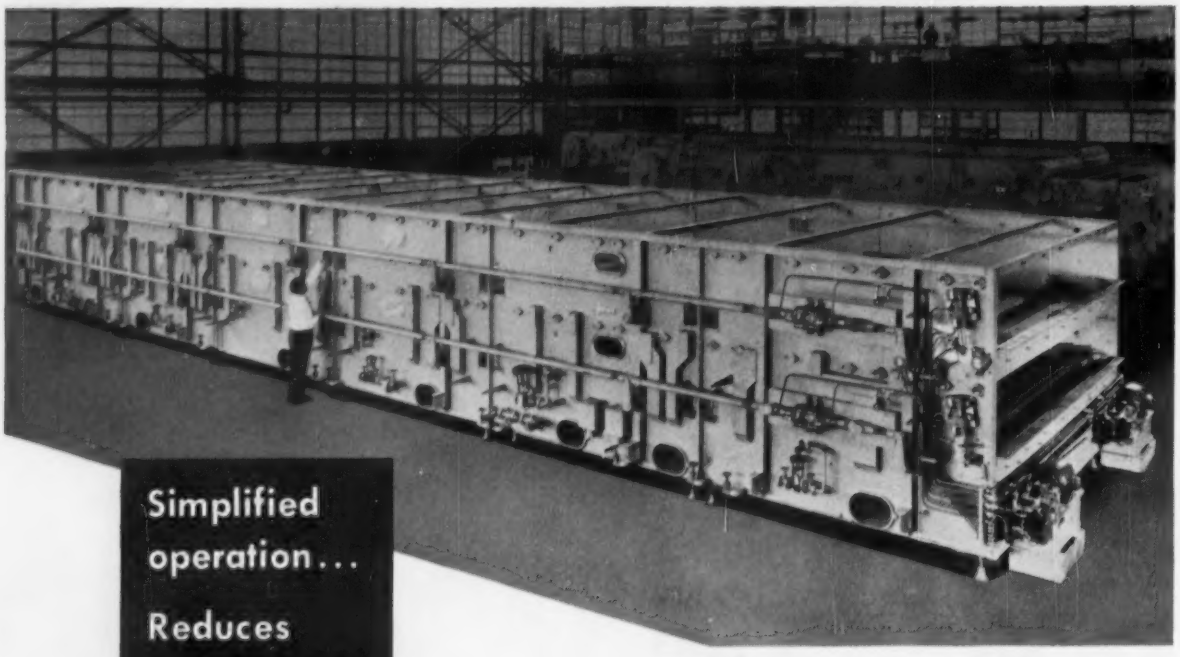
Subsidiary of Sterling Drug Inc.

1450 BROADWAY, N. Y. 18, N. Y.

VITAMINS, U.S.P.—[illegible] VANILLIN, U.S.P.—[illegible] CERTIFIED F. D. & C. [illegible] SPECIALS SANITIZED [illegible]

For more information, use coupon on last page.

LOOK...NO CHAINS! no cams...no gears



The *B-W VORTEX* Processor Hydraulic Drive

For smooth, dependable pasteurizing, cooling, freezing or exhausting, the Vortex is powered by a wear-free cushion of oil. This simple but rugged hydraulic unit drives the "walking beam" conveyor. Downtime for repairs and maintenance is practically nothing.

The "precision processing" made possible by the Vortex protects the quality of your products . . . assures complete uniformity . . . prevents spoiled batches. Even with unskilled workers, the simple and accurate automatic controls of the Vortex assure dependable quality control.

These are just a few of the features behind the fast-growing popularity of Vortex processors in the food industry. For complete information and technical bulletins, write:

BARRY-WEHMILLER MACHINERY CO.

4660 West Florissant Avenue • Saint Louis 15, Missouri

Most palatable beer came from coolship wort without filtration. Filtered wort beer from the same brew was milder but less full-bodied. Wort cooled immediately after striking the kettle gave beer that tasted raw and out of balance, while the same wort filtered as soon as cooled, produced a beer that was mild at first taste then harsh. — *Brauwissenschaft*, 127-29, 153-56, June-July, 1954.

Treating Brewery Effluents

After July 1, 1955, breweries in Belgium will not be permitted to discharge into public water courses effluents that have more than 0.5 ml. settleable solids per liter.

Studies show that these breweries now discharge, on the average, 150 cu. m. per 100 hl. of beer (15 bbl./bbl.). These comprise 5 types: Yeasty wastes, 5 cu. m.; alkali from bottle washing and miscellaneous cleaning, 1½; highly concentrated organic wastes, 7½; mild organic wastes, 65-80, and more or less clean water, 50-70.

Wastes containing yeasts may be centrifuged, with possible recovery of some beer. Those with organic sediments and diatomaceous earth may be filter-pressed or settled. The last two types, which make up over 90% of brewery effluents, may be separately collected and need no treatment.

In a brewery making 500 bbl. of beer daily, 700 bbl. of yeasty, alkaline and concentrated wastes will need settling and decantation. If yeast is centrifuged out this will be reduced to about 500 bbl./day—*L'Echo de la Brasserie*, 1059-66, Nov. 12, 1954.

Inactivating Enzymes

Experimental work has yielded data on the inactivation of pectinesterase in the juices of Valencia and Pineapple oranges and seedy grapefruit, with respect to temperature, retention time in the pasteurizer, and degree of concentration.

Prepared juices were pumped through a pasteurizer containing three heating coils of ¼-in. stainless steel tubing. Heated water was circulated around the coils, and the flow rate of the juice was adjusted in each tube to 560 ml. per min.

Juices were in contact with heat for 12, 6, and 3 sec., the time required to raise them to the desired temperature. Samples were cooled instantly by flashing under vacuum.

Results of the tests are presented in three elaborate tables from which commercial operators can evaluate their own methods of heat treatment —*Food Technology*, 498-500, Nov. 1954.

Time to look at weighing!

Dials on new Toledos can be faced any of 8 ways for operator convenience or full 360° swivel.

...on your scales material becomes money

Look to Toledo for new ideas to help you control costs! Good weighing is a fundamental of good cost control; basic accounting records of materials received, shipped or transferred start at the scale. In Toledo's complete line there is a modern answer to every problem of industrial weighing . . . in standard, or in custom-built units. When you look at costs . . . it's time to look at your weighing. There's a Toledo office as close as your phone. Toledo Scale Company, Toledo 1, Ohio.

**Write for new condensed catalog No. 2001.*

TOLEDO®

HEADQUARTERS FOR SCALES

For more information, use coupon on last page.

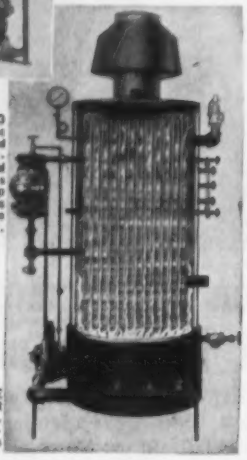
IS YOUR FLOOR SPACE AT A PREMIUM? ...USE A KANE VERTICAL BOILER PACKAGE

. . . chances are that floor space is at a premium in your shop or plant . . . if so, you needn't be robbed of this valuable space by a cumbersome, horizontal type boiler . . . not when a KANE *Vertical* BOILER PACKAGE will give you the same or probably better results.

The KANE BOILER PACKAGE includes: the correctly sized Automatic Gas-Fired Boiler complete with gas burner and controls to maintain required steam pressure; and an M-K-O Automatic Boiler Feed system designed to return condensate and supply make-up water as required for highest operating efficiency.

"Engineered Steam at its best, with over 50 years of experience at your disposal!"

Full details in new KANE Bulletin, No. 2K.



The M-K-O Automatic Boiler Feed returns condensate and supplies make-up water as needed to the KANE boiler.

The KANE Boiler, built to A.S.M.E. specifications, in sizes to 30 H.P.

INDUSTRIAL GAS EQUIPMENT DIVISION — GAS APPLIANCE MANUFACTURERS ASSOCIATION — CODE OF ETHICS SIGNER

MEARS KANE OFELDT INC.

DIVISION OF S.T. JOHNSON CO.

CHURCH ROAD, BRIDGEPORT, PA.

"Sales Office: 108-22 Queens Blvd. Forest Hills 75, N. Y."

Four Small Plants

—*Continued from page 65*

concentration, there was also considerable overlapping. To cut down on this, and thus save truck maintenance and gasoline expenses, customers were transferred from one company's jurisdiction to another. These transferrals were balanced so that no company wound up with a net loss in customers or revenue.

True, a few accounts were lost in this manner. But according to Mr. Pailet, "In seven months time, the word 'Harmony Farms' has become more of a household word than were our individual names after 20 yr. of operation."

This change-over has been restricted to retail accounts, but a similar switch with wholesale customers, who make up better than 80% of Harmony's total volume, is in the offing.

The geographical redistribution has paid off to the tune of 15-20% savings on total miles traveled. It has also given drivers more time in which to go out and sell new customers—a welcome opportunity, since they're paid on a commission basis.

Combining delivery fleets led to the aforementioned saving on the purchase of gasoline. The individual dairies were able to buy only in 2,000-gal. trailer lots, at 3¢ below list. Now they buy in 5,000-gal. transport quantities at a saving of 6¢ per gal.

Refrigerated Trucks

To ease distribution problems further, Harmony has now embarked on a program of mechanically refrigerating its trucks—a job that is about 30% complete. This not only allows loaders to fill the trucks earlier in the morning, but it reduces spoilage in left-over cartons at the end of the day's run.

Cost of the project is $800 per retail truck, $1,000 for wholesale vehicles. Such an investment would never have been possible while the four dairies were working independently.

In the old dairies, filled bottles and cartons were moved in and out of the cooler to the loading dock by carts. Now, with some pieced-together and used equipment, a moving conveyor line leads from the carton and bottle fillers directly to the cooler. However Mr. Pailet feels that the truck loading, which is still done by hand, is antiquated. So possibilities of pallet loading are being studied. At present it takes six loaders 10 min. per truck.

The labor picture (the plant is not unionized) is not so rosy. The company has found it very difficult to eliminate men with the same ease as machines. For one thing, equipment runs longer hours, thus requires more constant attention. One man in a small dairy might, for instance, have been able to oversee the weighing in of raw milk, and then go over and supervise the pasteurization process. Now a man is needed constantly at both posts.

This has the advantage, however, of keeping the man on a single job, making him an "expert" in his particular type of operation. This attention, Mr. Pailet states, has a marked effect on quality control.

Total employment, including drivers is now 95. In comparison, there were about 100 in the original four dairies.

Mr. Pailet is not anxious to reduce this figure. "We are at the point now," he says, "where we can up our output 10 to 15% without additional personnel. And we want to keep it that way."

One of the most tangible results of the entire plan is the advertising program, now being carried out via TV and radio spots, newspapers, and point-of-sale advertising. Before the combine, the money put into advertising by the individual concerns was negligible, not because they didn't have room for advertising in their budgets, but because the amounts of money they could appropriate couldn't do an optimum job of reaching their market. Now Harmony is spending $24,000 a year on advertising, pushing a single name before the public.

Mr. Pailet says he and his fellow officers are well-satisfied with the form of the company as it now stands. And, further, they have no plans for taking on additional independents.

Mr. Pailet may even seek to extend his idea into other cities. He sees such cooperatives as possibilities in Dayton as well as a number of other Ohio communities. In such moves, corporate identity would be retained under the title "Harmony Farms."

End (*Resume reading on page 66*)

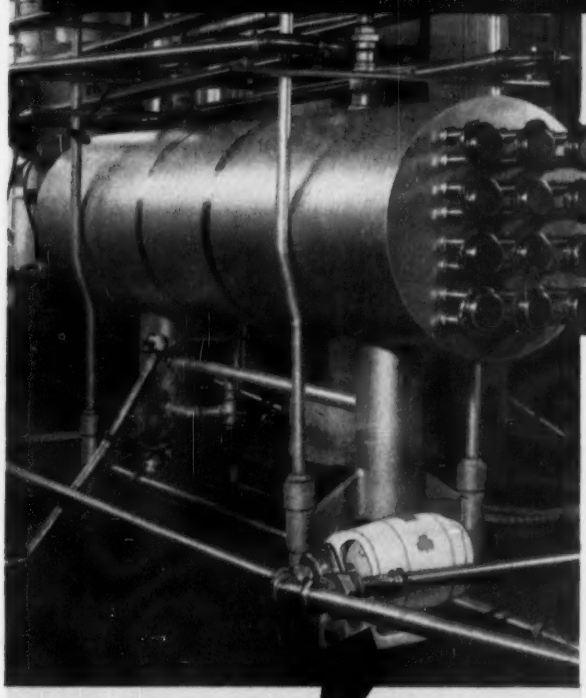
Tomorrows Executives

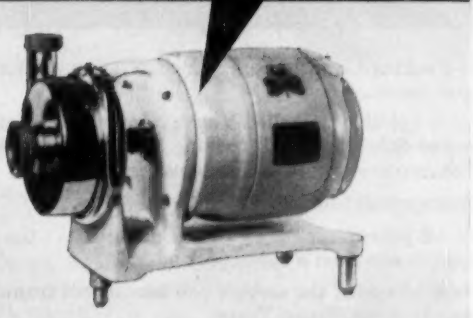
—*Continued from page 67*

lished benefits: It has been the means of discovering formerly unrecognized talent and ability—and so has meant advancement for some of these committee members. Also, enlarging the committees has upped morale, because it has permitted participation by a greater number of persons.

Serving on the Junior Board calls for extra labor on the part of the members. They must carry the obliga-

TRI-CLAMP *"Return Cups"* provide simple, fast disassembly for cleaning CHESTER-JENSEN HEATER





. . . can be used for "take-down" or cleaned-in-place service

• This Chester-Jensen Heater is unique in that it does not employ conventional methods of return flow. Instead, a stainless steel return cup takes the place of complex return covers or fitting assemblies. The return cup is held in place with a simple TRI-CLAMP toggle union.

The advantages of these Tri-Clover snap-action clamps are obvious—faster, simpler original assembly at lower cost—and speedy disassembly for cleaning, inspection, or replacement.

While this is a specialized application of the exclusive Tri-Clover TRI-CLAMP principle, the same basic advantages apply to the full line of TRI-CLAMP stainless steel ells, crosses, tees, laterals, etc., for use in either "take-down" or cleaned-in-place lines. When installed in "take-down" lines, the "easy on and off" feature means a tremendous savings in labor at wash-up time. When used in C-I-P lines, Tri-Clamp fittings offer important savings in both original cost and in maintenance expense.

See our display at the 1955 Canner's Show, Chicago BOOTH 14

Included on the Chester-Jensen heater system is the Tri-Clover *"Pump King,"* one of a complete line of Tri-Clover sanitary pumps — that years of service have proven will out-perform and out-last any other centrifugal pumps available to the dairy industry. These pumps feature: *Wide choice of seals — Design that actually exceeds 3A sanitary standards — Streamline heads for faster assembly and disassembly — Patented impeller for higher efficiency — Pump heads that can be turned 360 degrees to simplify installation* — and many other features which make it the most "copied" pump in the industry. *For full details, send for Pump Catalog 253.*

SEND FOR NEW CATALOG

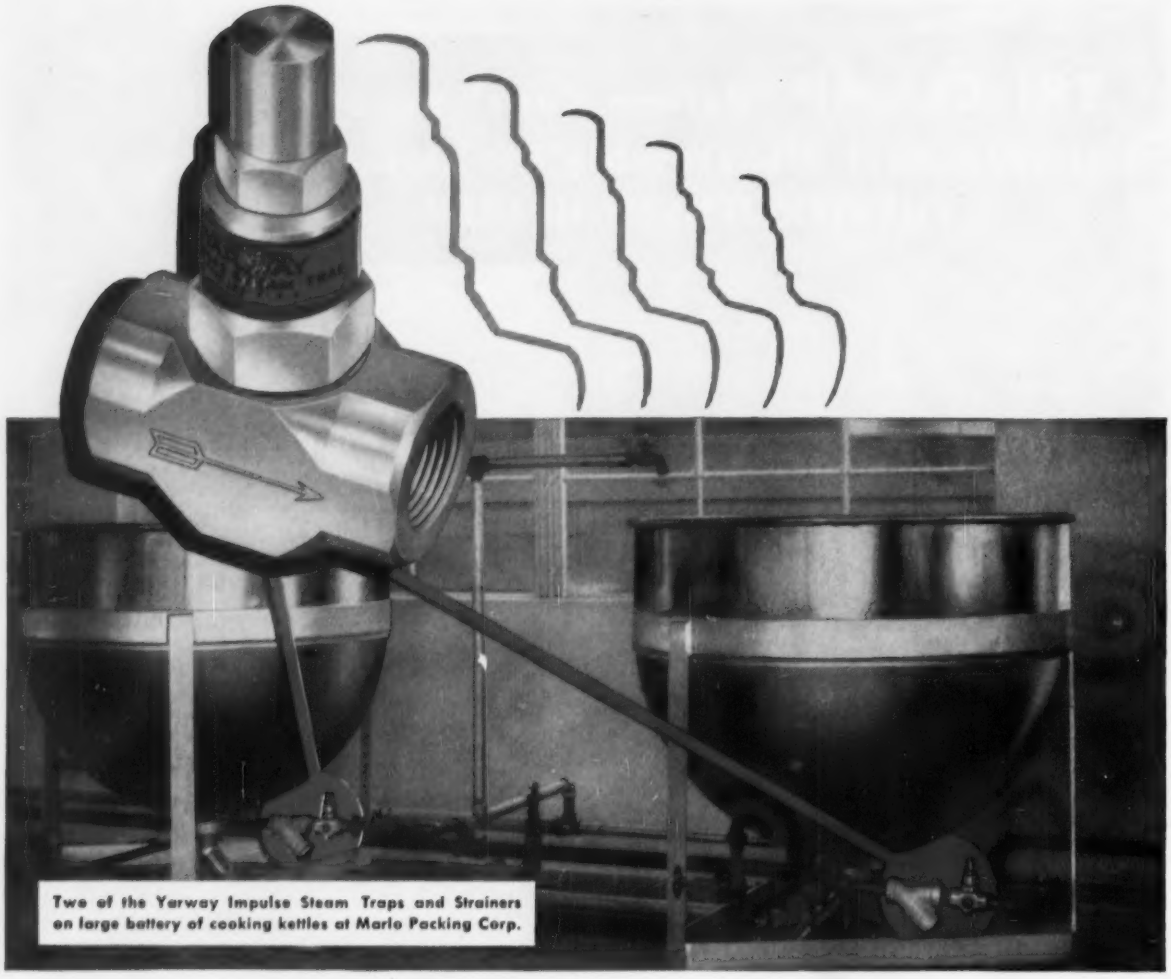
Complete details and specifications covering the full line of TRI-CLAMP Stainless Steel Fittings are available in the new Tri-Clover Catalog 1-154. Send for your copy today.

S155

LADISH CO.
Tri-Clover DIVISION
KENOSHA WISCONSIN

See your nearest TRI-CLOVER DISTRIBUTOR
EXPORT DEPT., 8 So. Michigan, CHICAGO 3, U.S.A. Cable: TRICLO, CHICAGO

For more information, use coupon on last page.



Two of the Yarway Impulse Steam Traps and Strainers on large battery of cooking kettles at Marlo Packing Corp.

YARWAYS make it (hot) for "Chili"— over 6 years

Marlo Packing Corp. in San Francisco is famous for chili con carne.

Six years ago they installed Yarway Impulse Steam Traps and Strainers on all cooking kettles to get that chili *hot in a hurry.*

The Yarways did just that.

Today—6 years later—they're *still* doing it . . . the same traps, with not even a spare part added!

That's evidence of the service you can expect from Yarway Impulse Steam Traps.

Only *one moving part* in a Yarway Impulse Trap—a small stainless steel valve. It *floats on the condensate load*, discharges condensate as it forms, keeps heat at the peak!

Other advantages—small size, lightweight, low cost, stainless steel body and parts, quick delivery from 250 local distributors. For name of nearest one, and free trap catalog, write . . .

YARNALL-WARING COMPANY
127 Mermaid Avenue, Philadelphia 18, Pa.

YARWAY

impulse steam traps

and Yarway Fine Screen Strainers

tions of their own jobs and in addition a considerable responsibility as board members, the latter requiring additional hours and effort.

Nevertheless, no junior executive has refused to serve, once elected, even though there is no dollars-and-cents compensation for the additional work and responsibility. Why?

First off, this service allows a junior executive to get to know more of what is going on in company business and more company plans. And who doesn't like to be "in the know"?

Further, almost the only opportunity for advancement for most junior executives is by becoming specialists in their particular jobs or types of work—that is, to delve more and more in sales, production, laboratory control, engineering, accounting, etc.

When serving on the Junior Board each member must work on problems that require attention to many company operations. Solution of these problems may require consideration of public relations, personnel and industrial relations, sales, engineering, production, quality control, advertising, or matters of transportation.

Those who serve frequently on the board become familiar with all of the operations of the company. They regularly face the problems of top management. Though the Board's findings are without authority, those who serve makes decisions just the same as do the top-management executives. And the matters are often as vital.

This further clarifies how, in serving, members obtain the training and experience to qualify them later as Senior Board members and artery heads.

Types of Projects Considered

Junior Board recommendations adopted by company.

1. A profit-sharing savings-and-retirement plan.

2. Expansion of research facilities to include an extensive work-simplification department.

This department last year used more than 50 miles of motion picture film recording company operations, from secretarial work to loading milk trucks, with the major objective "how to make it easier."

3. A waste-elimination program.

4. Daylight and every-other-day deliveries.

5. Establishment of a Personnel Department.

6. In-company training courses.

7. Milk and ice cream merchandising plans.

8. Reducing debentures to $50 denomination to make them more readily purchasable by employees.

End (Resume reading on page 68)

When it's WET-STRENGTH you want—

Patapar® has it!

A heavy weight pulled up and down in boiling water is one way to show the incredible wet-strength of Patapar Vegetable Parchment. Patapar won't weaken. It comes through glistening and strong.

Resists grease, too

The high wet-strength of Patapar plus its high resistance to grease or oil penetration has been the answer to many kinds of packaging and other problems – just as it may be helpful to you.

MANY DIFFERENT TYPES– Patapar is produced in hundreds of types for a variety of applications. As a packaging material it has set high standards of protection for foods like butter, poultry, margarine, ham, bacon, cheese, sausage, ice cream. Special types are used as a release lining for tacky substances, dialyzing membranes, release backing for polyester film, translucent master sheets for direct print copy machines.

Patapar is available in sheets or rolls – plain or colorfully printed.

SEND FOR SAMPLES–Tell us the application you have in mind and we will send samples of the type of Patapar we recommend. Write today.

PATERSON PARCHMENT PAPER COMPANY
Bristol, Pennsylvania
West Coast Plant:
110 Bryant Street, San Francisco 7
Sales Offices: New York, Chicago

Patapar
Vegetable Parchment
HI WET STRENGTH · GREASE-RESISTING

HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

FOAM'S A THIEF

KILL IT *with* DOW CORNING ANTIFOAM AF EMULSION

Now you're the boss! Foam no longer dictates productive capacity, output or processing times as witness these examples:

- ***strawberry concentrate cooling time reduced 25%.***
- ***dairy saves 300-400 gallons of skimmed milk daily.***
- ***yield on textile vat dyes doubled.***
- ***vacuum concentration capacity increased 60%.***

Effective at remarkably low concentrations against the widest variety of foamers, Dow Corning Antifoam A and the more easily dispersed Antifoam AF Emulsion are physiologically harmless; pay for themselves many times over because they ● ***eliminate the waste and fire hazard of boil-overs*** ● ***reduce processing times*** ● ***save the space previously wasted on foam in process equipment***

see for yourself! mail coupon TODAY for **free sample**

DOW CORNING SILICONES

Dow Corning Corporation
Midland, Mich., Dept. 5502

Please send me data and a free sample of
☐ Dow Corning Antifoam A
or ☐ Dow Corning Antifoam AF Emulsion

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

Questions & Answers

THIS MONTH'S PROBLEM

Can't Get Proper Fills

Question—Before purchasing a second-hand filling machine, we made some test runs and found the equipment satisfactory. For these trials we made small batches of prepared cake mix in a horizontal ribbon-type mixer. Each batch was then packed in drums, transported to our machine shop, and there test filled. But when we installed the machine in our production line, we found that we were unable to get the fills obtained in the testing. On the line, cake mix is fed directly from mixer, through sifter, and into hopper of filler. Can you offer any ideas as to the trouble and its solution?

DECEMBER PROBLEM

Glass Gets Into Jars

The question was—We fill various types of food products into glass containers on several different automatic filling lines. From time to time, we receive reports indicating the presence of glass fragments in finished products. Can you suggest how we can detect these fragments before shipment as well as prevent them from getting into the glass container?

Answer—Many complaints on glass fragments have been found to originate from causes other than actual presence of such particles in the container at time of packing. Often these reports arise from sand particles not fully removed when washing vegetable products.

In some marine products, "glass fragments" have proved to be harmless struvite crystals. Formation of these crystals in the product, through the action of magnesium and ammonium phosphate salts, can be inhibited by a special salt additive now available.

Numerous other cases of glass fragments in food have been shown to be due to failure of the housewife to pry off the closure in the recommended manner. But with the many good types of inexpensive or free openers now distributed, one may perhaps expect less of this trouble in the future.

As a positive means of assuring that every glass container used by the manufacturer be free of glass fragments at time of packing, I suggest incorporation of an air-jar cleaner in the line just prior to his filler. By inverting each container and sweeping out its contents with an air jet, it will be freed of glass fragments as well as other extraneous matter.—Gideon E. Livingston, Assistant Professor, University of Mass., Amherst, Mass.

More on Question

This problem has received much study. However, we do not know of any absolutely reliable method of detecting glass fragments in filled containers. Reason is that they will not show up well in X-ray inspection and are impossible to detect visually in anything except transparent products.

Even highly sensitive scales could not be completely relied upon to reveal presence of fragments in view of the variation in weight of individual containers. Perhaps some inspection instrument could be devised upon the same principle as flaw-detectors for metal inspection. These employ the reflection of ultrasonic vibrations. However, we are not aware of any such device being available as yet.

As pointed out, some customer complaints of this type certainly are not the fault of the packer. Quite often, improper handling or opening of the container in the home are responsible.

Whenever possible you should procure the offending particle, since your glass-container maker can often get helpful information from a study of it.

Best common-sense preventive measures:

1. Be sure all empty containers pass through glass cleaning units before use. There are several effective ones on the market.

2. Make certain that whenever any glass breakage occurs, the lines are stopped while jars adjacent to the

How Would You Do It?

Readers are invited to submit to FOOD ENGINEERING answers to question, "This Month's Problem." Selected answers will be published, with credit (unless you specify otherwise). We pay space rates.

What is *Your* Problem?

Subscribers also are invited to send in food engineering questions. We undertake to provide answers, free, to the best of our ability. We do not undertake costly investigations. Give full information and your name. Your identity will not be disclosed.

Write to Questions & Answers Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

because they

Stand Up

for FOOD PACKING
for FOOD SHIPPING
for FOOD SELLING

Approved Packaging for:

Coffee—Ground
Coffee—Soluble
Tea
Sugar Confectionary
Sugar Brown
Chocolate Powder
Baking Mixes
Dessert Powders
Dried Eggs
Dried Milk
Cookies
Spice Compounds

Kard-O-Pak Pliofilm or Polyethylene-lined bags by AMERICAN will give you efficient packaging performance from point of packing to point of sale. Here is simplified packing with sealed-in protection against air, moisture, liquids, grease, or oil. Kard-O-Pak is a stand-out food seller with its self-opening stand-up base that stacks so neatly on the shelf, that assures dimensional stability with sales-winning showmanship. Kard-O-Pak bags by AMERICAN will give your food products sealed-in Vacuum Freshness at a considerable saving over conventional rigid containers. Now used on Gump, Consolidated, Fry, Benco and other equipment. Write today for the complete Kard-O-Pak story.

American *Bag and Paper Corp.*

WATER and SOUTH STREETS • PHILA. 47, PA.

SELL WITH "ALL-AMERICAN" QUALITY

For more information, use coupon on last page.

NEW

EFFICIENCY and SANITATION in the INSPECTION CYCLE

of processing lima beans, cut beans, mushrooms, diced carrots

the NEW Robins "ROLL-OVER" INSPECTION TABLE

UNIQUE ROLL-OVER ACTION increases efficiency of inspectors—a factor in quality and appearance of your finished product. Flexibility of design permits "custom assembly"—into any desired width and length—and with as many turn-overs as required.

Belt is of non-absorbent Neoprene; all other contact areas are of stainless steel. Turnover pulleys are of stainless steel materials. All other pulleys are of the solid seal sanitary drum type.

SPECIFICATIONS AVAILABLE ON REQUEST

A. K. Robins AND COMPANY, INC.

Manufacturers of Food Processing Machinery Since 1855

713-729 E. Lombard St., Balto. 2, Md.

For 100 years, food processors have consulted Robins on equipment, methods and processes. Robins engineers have helped design many of today's most modern plants.

For equipment and supplies—consult the Robins catalog. For assistance or advice on a production problem, or for service on equipment, a Robins field engineer can help you. A wire or phone call will start a man, a catalog—or both—on their way to you.

break are carefully inspected for presence of glass fragments.

3. Provide suitable protective covers over filler hoppers, glass-container conveyors, and similarly guard any other areas where glass particles could accidentally enter product or containers. It should be remembered that glass breakage often sends particles flying a number of feet through the air.—*The Editors.*

Abolishing Window Breakage

Question—We have been conducting a special survey of our entire plant to see what we can do to eliminate chances of any glass particles contaminating food products. Our quality control department has pointed out that one possible source of glass entry is breakage of panes of window glass near tanks, bins, conveyors, etc. What would be your suggestion for the best measures against this hazard?

Answer—We assume that it must be impractical in your case to provide complete shielding or coverage of all places where foods may be exposed. Therefore, you might be wise to consider replacing the glass panes with a clear plastic sheet material, such as an acrylic plastic.

Material approximately $\frac{1}{8}$ in. thick is said to have ten times the impact resistance of double-strength window glass. And it is suitable for pane sizes up to 24 x 36 in. In quantities of 150-499 sq. ft., it costs approximately six times as much per square foot as window glass. However, it is estimated that a single pane installation of plastic would cost no more than two installations of glass.

On this basis, you would not only have much greater protection for your product against contamination, but in terms of plastic-life against glass-life you stand to save money on re-glazing expense as well.

Be sure to use the proper grade plastic for outdoor exposure, and that there is proper tolerance for thermal expansion. It is also necessary to avoid use of window sprays on this material, and also to guard against scratching, since the plastic is somewhat softer than glass.

Q.–Please tell us how to make a pineapple glaze.

A.–Bring to a boil, 5 lb. of unsweetened pineapple juice and 3¼ lb. of sugar. Mix 6½ lb. of cornstarch and 1 lb. of unsweetened pineapple juice. Then add to batch of boiling juice and sugar. Stir and cook until clear. –Formula by Pineapple Growers Assn., San Francisco.

Vacuum Forming Macaroni

Question—We have been hearing many claims lately about various methods of vacuumizing presses for macaroni and spaghetti products. Just what advantages, if any, could be expected from vacuumizing?

Answer—It is true that there are differences of opinion with regard to the mechanics of applying a vacuum to mixing and pressing equipment, and also on the magnitude of vacuum to employ. However, there is better agreement on what vacuum at this stage of processing will do for the product.

For one thing, it appears to improve the color of the finished product. This is believed to be on account of the removal of most of the oxygen from the dough, which under ordinary conditions of pressure and temperature at time of extrusion tends to oxidize the pigments giving the desirable yellow color.

Secondly, the removal of most of the air from the dough results in a smoother product by minimizing the "explosion," or violent escape of entrapped air upon release of the high extrusion pressure.

Thirdly, by practically eliminating voids in the dough, it makes a more homogeneous product. This retains its shape better upon cooking, and there is some evidence that it may also dry faster.

Fourthly, use of vacuum is said to make possible an increase in press capacity of approximately 10%.

These advantages are rather impressive when summarized, giving better appearance at both time of purchase and at time of eating, and, at the same time, improving the performance of both pressing and drying equipment in the manufacturer's plant.

There are things to be said for and against the different vacuum systems presently being offered, but there seems to be little doubt that the use of vacuum in some form is a very promising development and will shortly be recognized as a definite trend in the industry.

Making French Coffee Cake

Question—How should I go about making French coffee cake?

Answer—Cream in a beater-type mixer 1 lb. and 14 oz. of sugar and the same amount of shortening, then add 1 lb. 14 oz. of whole eggs. Now introduce 1 lb. 2 oz. of yeast (dissolved in a little water), 30 lb. of basic coffee cake dough, and 3 lb. of cake batter (yellow or white). Next add

sufficient bread and cake flour to bring batch to consistency of a firm cake batter.

Scale batter into cake pans (spreading dough out evenly), egg-wash tops, and sprinkle with any kind of coffee cake topping. Allow to rise and bake at 365 F.

Food Poisoning Complaints

Question—Last summer, we had several customer complaints in which our product was implicated in suspected food poisoning. Can you furnish us with suggestions on a course to be taken in the future so that we can be in a better position to act wisely?

Answer—First step is to prevent food poisoning outbreaks by making every effort to exercise all possible precautions in the manufacture of your products. And such prevention can be greatly promoted by emphasizing the importance of proper refrigeration of your items. This applies not only to your employees but also to your retailers.

Next obtain the services of an experienced investigator and samples of the specific food whenever your product is suspected of being responsible for pood poisoning.

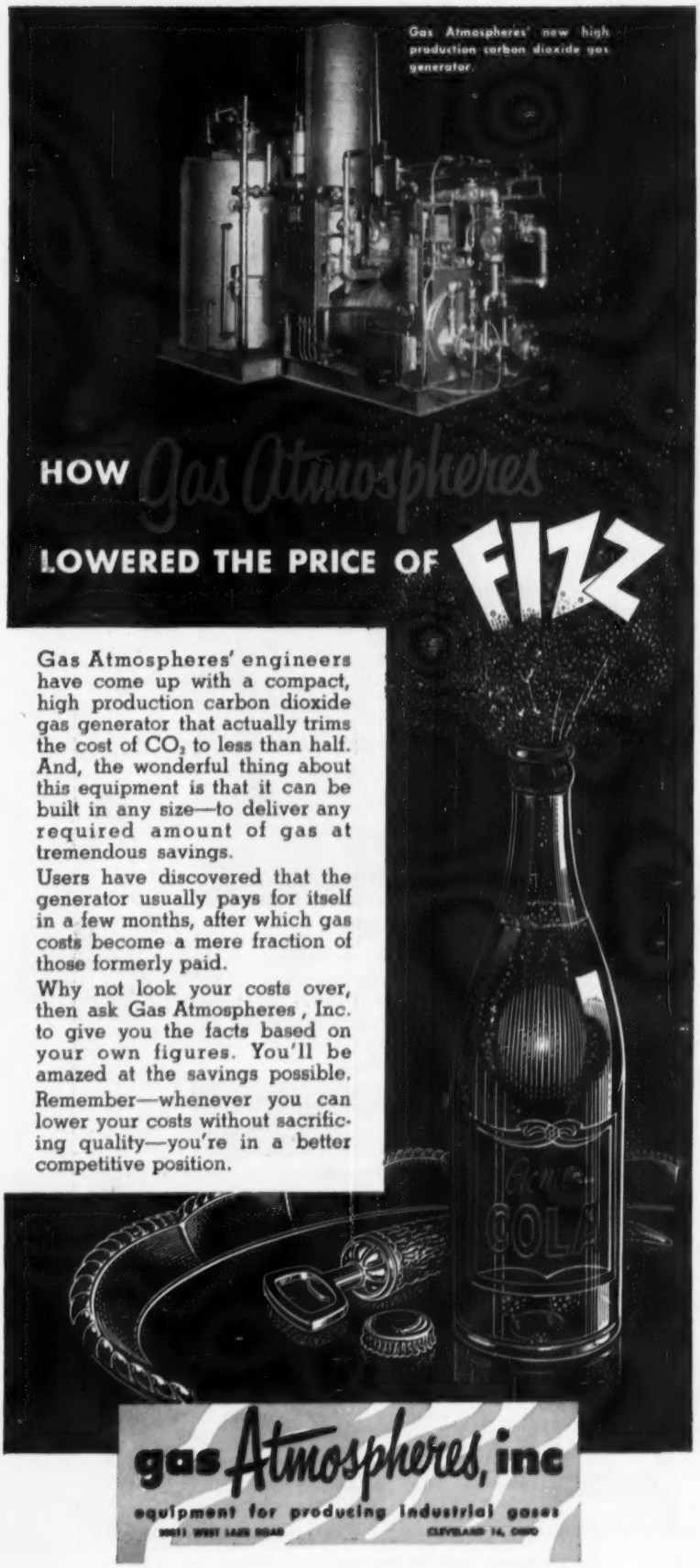
Purpose here is to establish, as much as possible, true cause and source of the illness. And promptness in obtaining such information and samples often can prove that questioned products were not responsible for specific illnesses.

Suspected food samples should be immediately refrigerated (less than 40 F.) and shipped to a laboratory. Best way is to dry-ice pack samples in a well-insulated shipping box. Include in the shipment as much information as possible on how sample was handled since the meal and other pertinent facts about the case.

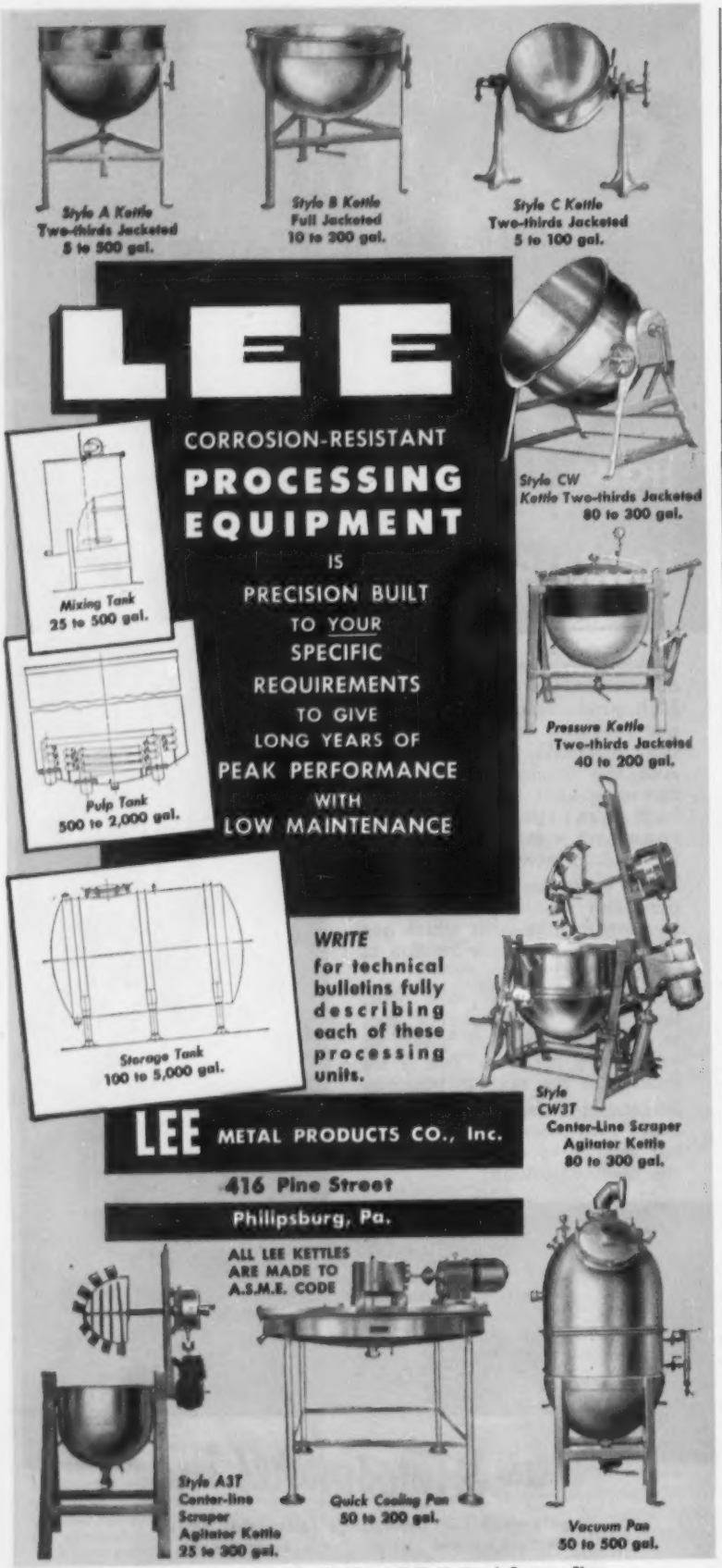
Information needed: (1) Complete menu of each person (whether or not they became ill); (2) interval between eating and first symptoms; (3) nature and duration of symptoms (if doctor called, get report from him); (4) peculiar taste, odor, or appearance of any particular food; and (5) how foods were handled after purchasing.

Q.–Do you have a good formula for making snapper soup?

A.–Snapper meat, 9 lb.; water, 3 gal.; tomatoes, 2 lb.; onions (minced), 9½ oz.; lard, 10 oz.; flour, 5 oz.; cloves (whole), ½ oz.; white pepper, ½ oz.; minced parsley, ½ oz.; minced garlic, ½ oz.; mace, a pinch; and a little bay leaf.


Gas Atmospheres' new high production carbon dioxide gas generator.
HOW Gas Atmospheres
LOWERED THE PRICE OF FIZZ
Gas Atmospheres' engineers have come up with a compact, high production carbon dioxide gas generator that actually trims the cost of CO_2 to less than half. And, the wonderful thing about this equipment is that it can be built in any size—to deliver any required amount of gas at tremendous savings.
Users have discovered that the generator usually pays for itself in a few months, after which gas costs become a mere fraction of those formerly paid.
Why not look your costs over, then ask Gas Atmospheres, Inc. to give you the facts based on your own figures. You'll be amazed at the savings possible.
Remember—whenever you can lower your costs without sacrificing quality—you're in a better competitive position.
gas Atmospheres, inc
equipment for producing industrial gases
CLEVELAND 14, OHIO

For more information, use coupon on last page.



See our display, Booth 40, Machinery Hall, National Canners Show.

Diabetic Ice Cream

Question—We are trying to track down the manufacturer of high protein, low lactose, non-fat milk powder. Reason is that we'd like to try it in a diabetic ice cream. Can you offer us a formula for using this milk powder in a diabetic ice cream?

Answer—Maker of this new milk powder is Western Condensing Co., Appleton, Wis.

Here's a formula from B. E. Hubbell, Jr., of the U. of Calif.: Butterfat, 12-14%; low lactose milk powder (EF 805), 9%; Sorbo, 15%; and saccharin (powdered), 0.01%. Use a pure emulsifier-stabilizer without added sugar.

The mix should be assembled and processed in the usual way. Care should be taken, of course, to prevent mixing with regular product. Only non-sugar flavors (vanilla, coffee, and maple) should be used. Overrun should be under 100%.

Trouble Making Topping

Question—*I have been having considerable difficulty making a chocolate sundae topping. This is the situation: When the topping is poured over ice cream, it becomes stringy and taffy-like. I wish the topping on the ice cream to be of the consistency of, say, butter at room temperature, so that it can be spread around with a spoon. (Formula submitted, but not for publication.)*

Answer—This is a difficult problem, and we do not have a wholly satisfactory answer. The heavy consistency at the temperature of the ice cream (over which the topping is poured) is contributed, in part, by the high content of milk solids and, in part, by the high melting fats such as the cocoa butter from the chocolate liquor and the fat of the added shortening.

Consistency can be reduced by lowering the milk content and by replacing the high melting fats with liquid vegetable oil. However, lowering the milk content and the replacement of the chocolate liquor may result in some loss of flavor quality.

The following formula is suggested for trial but is not expected to give the full flavor of the original formula. To prevent sugar crystallization from the increased sweetener content of the suggested formula, a high conversion (low viscosity) corn syrup is suggested as a part of the sweetener content.

Suggested topping formula: Sweetened condensed milk, 108 lb.; sugar, 150 lb.; a high-conversion corn syr-

up (sweetose), 62½ lb.; cocoa powder, 27 lb.; water, 9½ gal.; vegetable salad oil (corn, cottonseed, cocoanut, or peanut oil), 48 lb.; lecithin, 5 oz.; and salt, 2 lb.

Mix sugar and milk, introduce cocoa, mix, add corn syrup and water, and then heat product with stirring to 208 deg. F. Turn off heat, add salt, vegetable oil, lecithin, and vanilla. Mix well and homogenize.—*F. H. Brock, Technical Service, Food Section, A. E. Staley Manufacturing Co., Decatur, Ill.*

Handling Cellophane

Question—In expanding our line, we are about to produce certain products that will be packaged in cellophane. We have not previously handled this material, and are wondering if there are any particular precautions to be observed in stocking supplies. Could you give us some guidance?

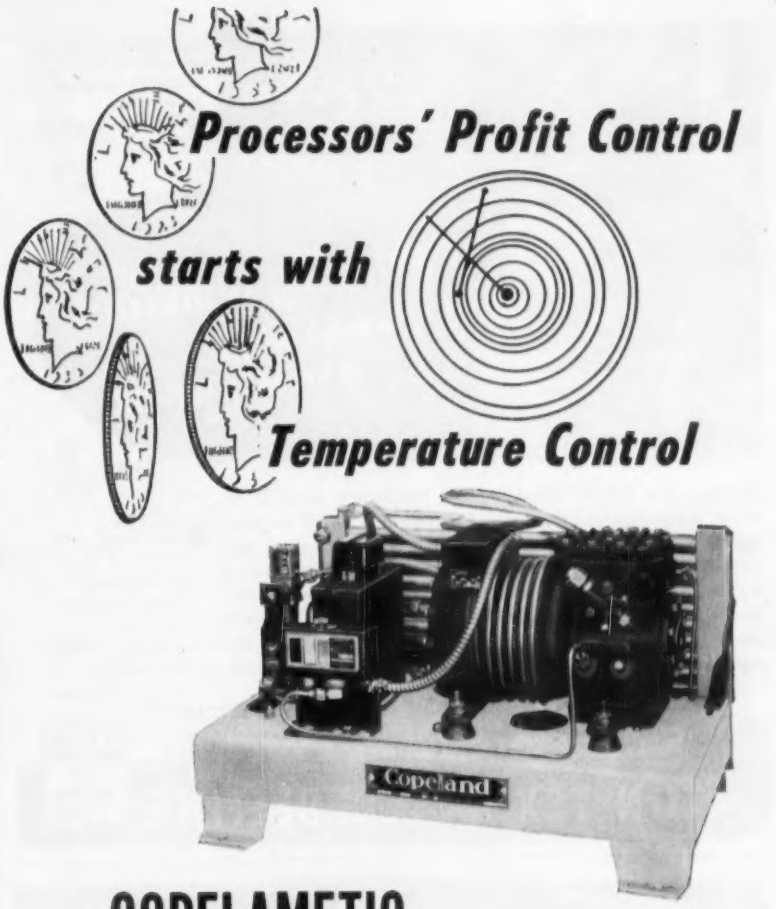
Answer—Manufacturers of cellophane suggest certain precautions to insure best results from this very versatile and useful film-packaging material. To begin with, optimum storage temperature is 65-75 deg. F., which fortunately is fairly close to average desirable temperatures in a food-packaging plant. Relative humidity of both storage and packaging operation areas is important, and desired ranges for various forms of cellophane may be obtained from the manufacturers as they vary slightly according to whether the material is moisture-proof or not, whether in roll, sheet, or bag form, etc.

Since desirable humidities lie in the vicinity of 50%, it may be necessary for you to provide for the addition of moisture to the air during cold weather, when normal relative humidities are low. For this reason, you may wish to store all cellophane in a room small enough to be easily humidified, if necessary. One of the easiest methods of humidifying air is to allow a little steam to escape into the room. A wet and dry bulb thermometer is necessary, at the very least, to keep a

---

Q.—Do you have a good formula for making coconut kisses?

A.—Beat in mixer into a firm meringue: 20 lb. of egg whites, 20 lb. of powdered sugar, 1¼ oz. of vanilla flavor, and 1½ oz. of salt. Then add 40 lb. of powdered sugar, fold in and add 20 lb. of macaroon coconut, dress onto paper-lined sheet pans, heavily cover with fresh shredded coconut, and bake at 300 F.—*Formula by Franklin Baker Div., General Foods Corp., Hoboken, N. J.*



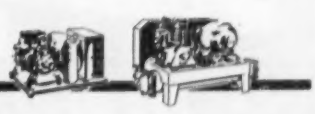
COPELAMETIC
THE Accessible HERMETIC

Positive refrigeration for perishables . . . that's the big reason so many food processors specify dependable Copelametic motor-compressors for their pre-cooling, freezing and storage operations.

Your merchandise can be processed at the peak of freshness and flavor, thanks to Copelametic's round-the-clock temperature constancy. Copeland's years-ahead design and precision manufacture build this long-run performance into every unit.

Permanent, forced-feed lubrication eliminates manual oiling, hushes operating noise to a whisper. Economical Copelametic units deliver consistently high BTU at low current input. Best of all, Copelametic combines hermetic advantages (no belts or seals) with *accessibility* . . . the plus feature that permits on-the-spot servicing. No Copelametic ever requires return to the factory!

Start holding a closer profit line . . . specify Copeland equipment, and get the positive refrigeration that means extra revenue and a higher-quality food product.



Copeland
DEPENDABLE Electric REFRIGERATION
COPELAND REFRIGERATION CORPORATION SIDNEY, OHIO

Conveying scalded tomatoes—the cannery's toughest job—at the Lord-Mott Company, Baltimore, Md.

skinning tomatoes ...a tough belt job is tamed by TON-TEX

The belt that directly carries scalded tomatoes is attacked by steam, water and intense heat. Each night it must be thoroughly cleaned with live steam. Ton-Tex belting takes this punishment day after day, season after season at Lord-Mott's. Its tightly woven plies of cotton duck are built to fit the job. Do you process or can foods? Ton-Tex belting can cut your conveying costs, too. Our engineers will help you choose the right belt for the job. Write today for complete information.

● *Conveying costs increased by moisture and heat? Ton-Tex belts will solve your problem save money!*

TON-TEX CORPORATION, GRAND RAPIDS 2, MICH.

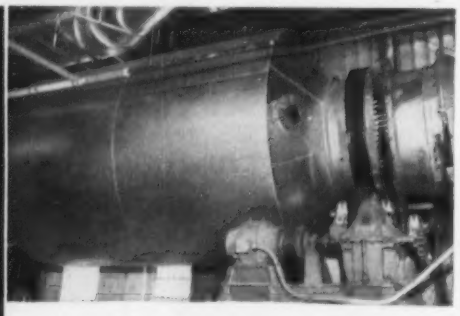
31 COLUMBUS AVENUE, ENGLEWOOD, NEW JERSEY — 759 W. SAN CARLOS STREET, SAN JOSE 26, CALIFORNIA

TON-TEX CONVEYOR AND TRANSMISSION **BELTING**

TON TEX

Foods are Dried Completely, Quickly, Economically in DehydrO-Mat*

* PAT. PENDING



BUILT IN A WIDE RANGE OF CAPACITIES, the DehydrO-Mat, though comparable in price, out-performs conventional dryers of similar size. Compact . . . easy to install in a minimum of space.

The DehydrO-Mat will not scorch or burn even the most sensitive products. Air, not inclination, moves the material . . . quickly through the hot zone, slowly through the temperate zone. Since no boiler is necessary, the DehydrO-Mat can be in full operation from a cold start within ten minutes. DehydrO-Mats utilizing steam-heated air are also available.

Manufacturers of "Wonder Line" Roto-Flo Washers, Cookers and Coolers, Plate Contact Freezers, Steam Boxes & Retorts, etc.

EDW. **RENNEBURG** & SONS CO.
Baltimore 24, Maryland, U.S.A.

check on the relative humidity conditions.

On the other hand, if you happen to be in a very humid climate, you may encounter sticking and blocking and, in that case, we recommend you consult with your supplier before actually using this material.

It is generally recommended not to stack supplies too high, so as to avoid too much pressure on the bottom layers. For example, sheet stock is best limited to stacks not over 6-12 in. high (the former for non-moisture-proof film). So you will doubtlessly want to provide shelving in your stock room for handling sheets.

Because of the many types and forms of cellophane—with varying requirements—this information should be considered as general. It would be best to ask your supplier for more specific instructions when specifications of your supplies have been definitely established. This will save you the necessity of maintaining more rigid conditions than may be required in your particular case.

Q. We've been making test-batches of coffee-flavored hard candies, and within a short time after they were packaged an off-flavor was detected. Can you put your finger on the cause?

A. We assume that you are using soluble coffee as the flavoring agent as well as a wax paper wrapper. If so, then the candy will pick up a petroleum-like flavor from the waxed paper wrapper. Your solution would be to go to another type of moisture-proof wrapper or work with your supplier in an effort to improve the waxed paper.

Manufacturing Scrapple

Question—Do you have complete instructions for making scrapple?

Answer—Cook separately at 165 deg. F. until tender: Pork snouts, 75 lb.; pork head meat, 50 lb.; plate beef, 50 lb.; and pork rinds, 25 lb. Make certain that rinds are cooked until they are very soft.

Now grind beef and head meat through ¼-in. plate and skins and snouts through ⅛-in. plate. Then add ground, cooked meats into an agitator-equipped, steam-jacketed kettle. Pump skimmed meat broth into kettle, leaving a portion in a separate vessel. Into separate broth, slowly and evenly sift, with constant stirring to form a thick lump-free paste, 70 lb. of corn meal (half white and yellow) and 20 lb. of soy flour.

Introduce this paste into the jack-

eted kettle containing broth and ground meats, and start agitator. At this point, add 7½ lb. of salt, 14 oz. of white pepper, 8 oz. of sage, 3½ oz. of mace, and 2½ oz. of nutmeg. Constantly stir during cooking to avoid lumping or scorching. Cook about 2½ hr. and, after cooling a little, pour scrapple into 1- or 2-lb. molds. Chill, until product solidifies, and then remove from molds and package.

Wishes Ice Cream Formula

Question—Do you have a formula for making ice cream with skim milk powder?

Answer—You did not state either the type of product you plan to use as a source of fat or the percent of fat in the ice cream mix. Therefore, we will furnish you with formulas for 10, 12, 14, and 16% fat mixes, using 40% butterfat cream and skim milk powder.

A 100-gal., 10% fat mix will contain: Cream, 230 lb.; powder, 95 lb.; cane sugar, 100 lb.; corn syrup solids, 55 lb.; stabilizer, 4¼ lb.; and water, 430 lb.

A 100-gal., 12% fat mix will have: Cream, 275 lb.; powder, 90 lb.; cane sugar, 110 lb.; corn syrup solids, 45 lb.; stabilizer, 4 lb.; and water, 390 lb.

A 100-gal., 14% fat mix will consist of: Cream, 320 lb.; powder, 75 lb.; cane sugar, 120 lb.; corn syrup solids, 35 lb.; stabilizer, 3¾ lb.; and water, 360 lb.

A 100-gal., 16% fat mix will have: Cream, 370 lb.; powder, 65 lb.; cane sugar, 130 lb.; corn syrup solids, 25 lb.; stabilizer, 3½ lb.; and water, 320 lb.

If you wish to use sweet cream butter (80% fat), then substitute 1 lb. of butter for 2 lb. of cream in the above formula. This will necessitate use of slightly more skim milk powder—10 lb. per 100-gal. for the 10 and 12% mixes, 15 lb. for the 14% mix, and 20 lb. for the 16% mix. Also, the amount of water should be increased. In the 10% mix, for example, use 95 lb. of additional water to make a total of 525 instead of 430 lb.

Q.—How much butterfat, milk solids, and overrun would you suggest to make a premium-quality sherbet?

A.—We recommend 1-2% butterfat, except in those states where a higher percentage is required. Use 5% milk solids or the maximum allowable under state law. And limit overrun to about 40%.

GELLING and THICKENING AGENTS IMPROVED..

Morningstar
SCIENTIFIC STARCH and WATER SOLUBLE GUM SERVICE

We manufacture laboratory controlled Water Soluble Gums and Starch Products. Our years of experience in developing and supplying these products for the most quality conscious firms in your industry, can be useful to you. Tell us your needs. Our modern line is sure to answer your problems.

WATER SOLUBLE GUMS
Agar-Agar
Gum Arabic
Gum Karaya
Locust Bean Gum
Gum Tragacanth
Irish Moss

STARCH PRODUCTS
Arrowroot Flour
Potato Starch
Tapioca Flour
Instant Pudding Base
Precooked Starches
Dextrines—Yellow and White

SEND FOR our Water Soluble Gum Inquiry Sheet. You fill in and return it for analysis and recommendations.

MORNINGSTAR, NICOL, INC.
Scientific Starch, Dextrine and Natural Gum Service
630 West 51st Street, New York 19, N. Y. • Phone: COlumbus 5-2860
1770 Canalport Avenue, Chicago 16, Illinois • Phone: CAnal 6-2219

There's a series of
NEW VIKING CATALOGS just off the press
showing the way to answer your pumping problems

Which catalog interests you?

B-e General Purpose Pumps
C-e Heavy Duty Pumps
D-e Underwriter Pumps
E-e Jacketed Pumps
F-e Sanitary Pumps
G-e Oil Industry Pumps
H-e LP- Gas Pumps
I-e Hydraulic Pumps
J-e Special Application Pumps

Just check above and attach to your letterhead.

See Our Catalog in SWEETS

VIKING PUMP COMPANY
Cedar Falls, Iowa

For more information, use coupon on last page.

Useful New Books & Government Publications

Five Management Functions

PRINCIPLES OF MANAGEMENT. *By Harold Koontz and Cyril O'Donnell. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York 36. 1955. 644 pages. 6¼ x9¼ in., cloth. Price: $6.50.*

Covering the five main functions of management: organizing, staffing, directing, planning, and control, this book deals with techniques and principles rather than with the more technical and specialized tasks.

Drawing on the experience and problems of many managers, the authors have added their own knowledge of the field and succeeded in presenting a comprehensive and detailed picture of management and its duties.

The book provides a conceptual frame work within which the principles and techniques of management can be analyzed and explained, and includes within this frame an up to date picture of management theory.

Sugar Industry Handbook

MANUAL OF SUGAR COMPANIES 1953/54. *Edited by Charles G. Kittner. Published by Farr & Co., 120 Wall St., New York City 5. 340 pages. 8¼x5 in., cloth. Price $2.00.*

Important sugar producing companies described with history, properties, capitalization, listing on exchanges, numbers of stockholders and employees included.

Synopses of 250 other domestic and foreign sugar companies, high-low prices of common and preferred sugar stock and dividends paid during 1953 also covered.

This work is seen as a valuable desk reference for those in the sugar trade.

Equipment Directory

OFFICIAL PACKAGING MACHINERY DIRECTORY. *Published by Packaging Machinery Manufacturers Institute, Inc., 243 Madison Ave., New York 17. 1954. 150 pages. Ring-bound, leather cover. Price: $10.00.*

A revised edition of an earlier publication, this directory is designed to serve as a ready reference for factory superintendents and others interested in packaging equipment. It is divided into three sections, listing trade names and manufacturers, and the names and addresses of the machinery makers with complete information on the machines each one makes. The last is alphabetically arranged for quick reference.

The ring binding allows the book to be kept up-to-date with the addition of new information as it is issued.

Manual on Vacuum

HIGH VACUUM IN INDUSTRY. *Published by High Vacuum in Industry, 35 Town Way, Winchester, Mass. 1953. 73 pages. 8½ x 11 in., paper. Price: $5.00.*

Of definite interest to food processors, this book includes chapters on vacuum measurement, basic equipment, vacuum coatings and thin films, vacuum tube exhaust, electronics, high vacuum drying, and food processes.

The report was compiled by a group of students at the Harvard Graduate School of Business Administration.

The section of food processors covers vacuum cooling, dehydration, liquid food concentration, and freeze drying.

Reports and Pamphlets

AGRICULTURAL, MANUFACTURING AND INCOME STATISTICS FOR THE DOMESTIC SUGAR AREAS. *Published by USDA, Washington, D. C. Price: $1.00.* Essential statistics for the individual sugar producing areas.

INDEX TO PUBLICATIONS. *Published by American Society of Bakery Engineers, Chicago. No charge.* Listing of all Society's publications during period 1924-1954.

CLEANING AND SANITIZING METHODS AND MATERIALS FOR THE MEAT PACKING PLANT. *Published by American Meat Institute, Chicago. No charge.* Information on practices which have proved sound in actual application.

AN IMPROVED SYSTEM OF RETORT INSULATION. *Bulletin No. 21. Published by American Meat Institute, Chicago, No charge.* Data on principles, equipment and installation.

FOOD ACCEPTANCE TESTING METHODOLOGY. *Published by Advisory Board on Quartermaster Research and Development, Chicago. No charge.* Proceedings of a symposium held in Chicago, 1953.

STABILITY OF DEHYDRATED EGGS. *Published by Advisory Board on Quartermaster Research and Development, Chicago. 98 pages. No charge.* Data presented is from a symposium sponsored by the Quartermaster Food and Container Institute.

AN INDUSTRIAL WASTE GUIDE TO THE MEAT INDUSTRY. *Published by U. S. Dept. of Health, Education, and Welfare, Washington, D. C. Price: $.15.* Description of processes, details on sources, quantity, and character of wastes, and application of remedial measures.

FE REPRINTS AVAILABLE

Difficult-to-find practical information on food plant operations and materials is available in the "roundup" reports and articles listed below. Single-copy reprint prices are given. For orders of 20 or more, there is a 25% discount. You order the reprints by circling the corresponding numbers on the Reader Service Coupon, inside the back cover. You will be billed when your order is filled.

8. Newer Ingredients $1.25

Twenty-page report on the newer ingredients which aid in producing better food products (May, 1952). It includes detailed articles on these subjects: (1) Guide to Optional "Chemical" Additives. (2) Antioxidants Provide New Flavor Controls. (3) Industrial Enzymes Now Speed-Natural Processes. (4) Food Emulsifiers Bring New Highs in Uniformity. (5) Seaweed Extractives Find Versatile Uses in Foods.

9. Quality Control $0.75

Nine-page report on simplified statistical quality control for practical food product improvement (Dec., 1952). New reference-table method is presented. It shortcuts complex mathematics of statistical technique, is especially suited to food plant operations.

10. Packaging Materials $1.00

Sixteen-page report on how to get better production-line performance with packaging materials and containers (March, 1952). It includes these comprehensive articles: (1) Developing Your Package for High Output. (2) How Properties of Materials Affect Packaging Speeds. (3) Nipping Production Slowdowns by Pre-Checking Supplies. (4) Tips on Ordering Materials for Top Performance. (5) Proper Storage of Your Stock Averts Line Headaches.

11. Sanitation $0.50

Six-page report on "How To Assure Top Sanitation in Your Processing Equipment" (Jan., 1952). This report was a preprint of one section of a practical book on food plant sanitation prepared by Association of Food Industry Sanitarians.

12. Materials Handling $1.00

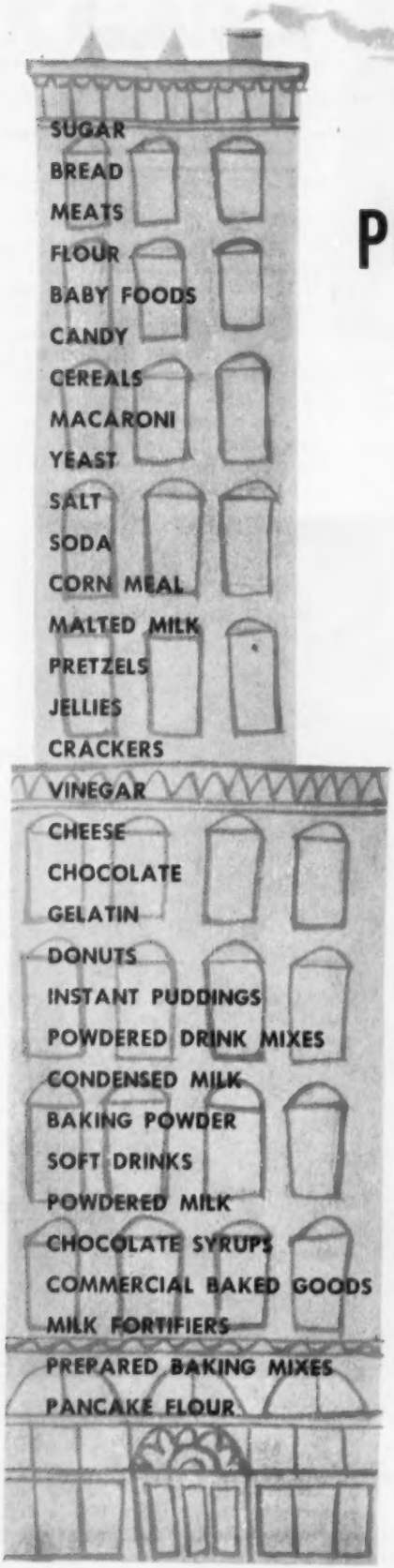
Twelve-page report entitled "How Modern Materials Handling Gives New Spurt in Processing" (March, 1951). Case histories of important savings through more efficient handling are presented. And the different types of handling equipment are described and illustrated.

13. Mixing $0.50

Four-page roundup of progress in plant mixing methods and equipment, plus a forecast of what is ahead (Oct., 1953). Performance data are included as yardsticks of what can be achieved.

14. Aseptic Canning $0.75

Eight pages, including foldout picture flowsheet, describe, evaluate, and illustrate in detail the continuous, short-time, high-temperature aseptic canning process that won the 1951 Food Engineering Award. (June, 1951).



PHOSPHATES....

improve all these foods

Yes, if you make any of the products listed . . . the right Victor "food grade" phosphate or phosphoric acid can improve your product at little or no extra cost! Victor makes a complete line of "food grade" phosphates for enrichment, leavening, buffering, or to prevent caking . . . of more than 30 processed foods. To find out how Victor phosphates can improve *your* product . . . fill out the coupon below and mail to: Victor Chemical Works, 155 N. Wacker Drive, Chicago 6, Ill. You'll find . . . *It pays* to see Victor!

VICTOR

Dependable Name in Chemicals for 57 Years

GENTLEMEN: Yes, we'd like to find out more about Victor phosphates.

We make _____

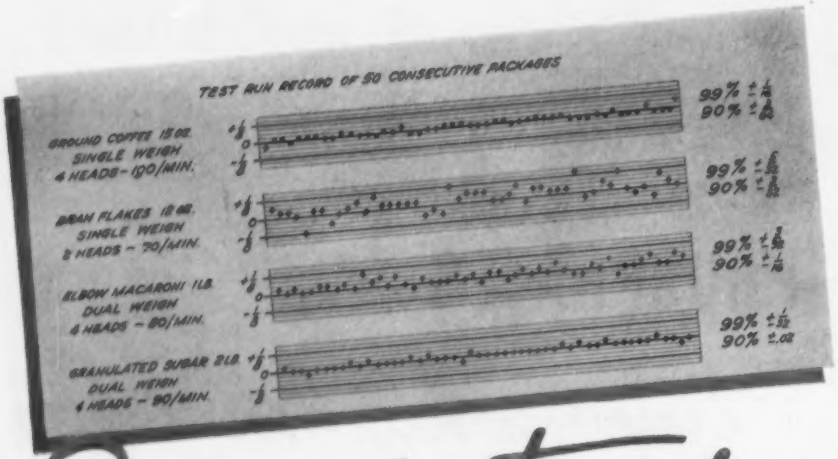
Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

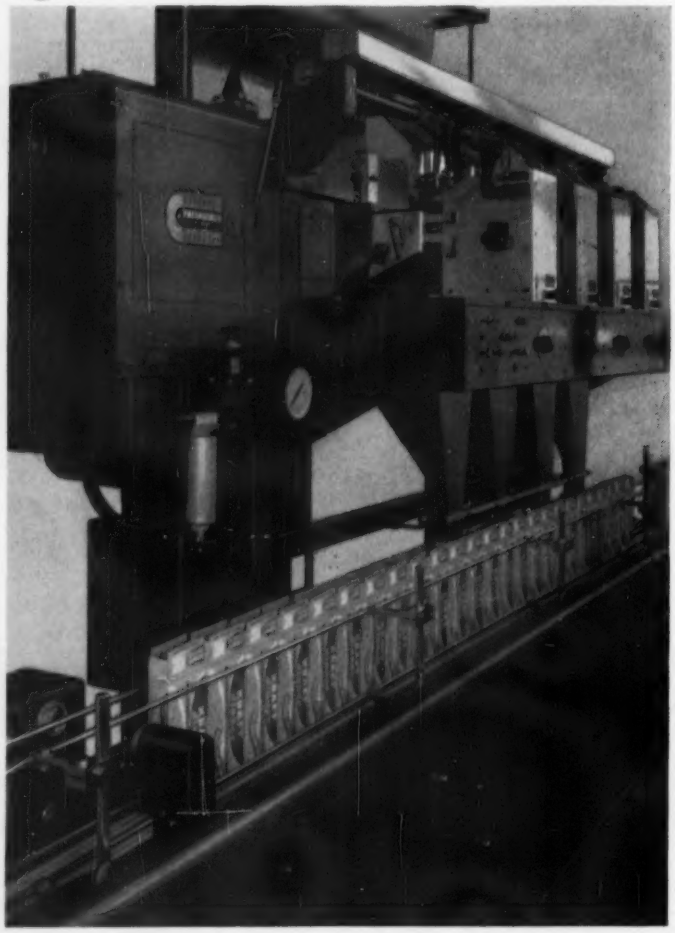
For more information, use coupon on last page.



For the best net yet...

Pneumatron

WEIGHS WITHIN HUNDREDTHS OF AN OUNCE!



The secret of Pneumatron is relatively simple—the results little short of miraculous. An air actuated control measures deflection in millionths of an inch—while weighing within hundredths of an ounce.

Delicate? No! There are no knife edges to wear or corrode, no fragile trip mechanisms to get out of adjustment. PNEUMATRON weighing is—

FAST—The Pneumatron head weighs more than twice as fast as any previous weighing beam. Two Head machines may be used where four scales were formerly required.

CONSISTENT—Weights hold to the line month after month without adjustment of controls.

ACCURATE—Accuracies heretofore impossible are now obtained by the Pneumatron!

MONEY SAVING — Eliminates over-weight give-away, saving thousands of dollars per year.

DURABLE—This is not a complex electronic or laboratory type piece of apparatus but is practical, easy to understand and sturdily constructed. The weighing assembly, entirely enclosed in a dust-tight case, will withstand considerable abuse without affecting its accuracy.

PNEUMATIC SCALE CORP., LTD., 91 Newport Avenue, Quincy 71, Massachusetts. *Also: New York; Chicago; Dallas; San Francisco; Los Angeles; Seattle; Leeds England. Canadian Division: Delamere & Williams Company, Ltd., Toronto.*

PNEUMATIC *Packaging and Bottling Equipment*

KEEPING UP WITH THE FIELD

Technical News • Washington Highlights • Economic Trends • Labor Developments

Food From Sun—First Step

Photosynthesis—Nature's elemental secret process by which sunlight energy is transformed into food energy—has recently been duplicated in the laboratory by a team of five scientists headed by Dr. Daniel I. Arnon, U. of California.

Reproduction of this process outside the living plant cell is the first step toward freeing man from full dependence upon crops and animals for food. In short, this finding may eventually help open an era of food abundance.

However, it must be recognized that any such practical application of the finding is still very far off.

By photosynthesis, plants convert water and chemicals (from the soil) and carbon dioxide (from the air) into sugars, fats, and proteins — primary food sources for all animal life.

New IFT Fellowships

A far-reaching graduate fellowship program for food technologists has now been launched by the Institute of Food Technologists, Chicago. And the donor, General Foods Fund, Inc., is particularly cited for its generosity in the project.

Available for 1956-57 will be three fellowships, valued at $4,000 each, for grad students showing top ability in food tech work. Further, two fellowships will be awarded for 1955-56, while one is already in force. In 1956-57 and the years thereafter three awards will be made by the Institute each year.

Ups Radiation Facilities

Speed of conducting experiments in cold sterilization of foods will now be doubled at Stanford Research Institute's Radiation Engineering Laboratory following arrival of additional cobalt 60 giving 2,000-curies of radioactivity.

This brings SRI's gamma radiation power up to a total of 4,000 curies.

The source material is stored and handled in a specially constructed laboratory pool of 5,400 gal. of water. Thus a safe shield against radiation is provided during the various experimental operations.

Launch Citizens Committee on FD&CA

Naming of the long-heralded citizens committee to study angles and aspects relative to enforcement of the Food, Drug & Cosmetic Act was completed in mid-January.

And as this issue of FE went to press, the first meeting of this new 14-member body was underway in Washington, D. C.

In announcing the new group — which is backed by a special appropriation of $21,000 voted by the last Congress—Mrs. Oveta Hobby, Secretary of Health, Education & Welfare, emphasized that choice of the members was guided by breadth of their viewpoints. Broad knowledge of consumer and industry problems was cited as desirable, as well as interest in civic affairs.

Cereal Man Chairman

Concept of the committee dates back many months during which the hot issues of additives, pesticides, inspections, and other controversial factors have been grappled, as well as numerous proposals for streamlining activities.

The number of the members with immediate food-industry relations is notable. Chairman of the committee is G. Cullen Thomas, vice-president of General Mills, Inc., Minneapolis.

Members: Charles Wesley Dunn, president Food Law Institute, New York City; H. N. Riley, executive vice-president, H. J. Heinz Co., Pittsburgh; Walter Silbersack, president, American Home Products Co., New York City; Robert A. Hardt, vice-president, Hoffman-LaRoche, Inc., Nutley, N. J.; Dr. Leonard A. Maynard, director, School of Nutrition, Cornell University, Ithaca, N. Y.; and Miss Catherine Dennis, president, American Home Economics Assn., Raleigh, N. C.

Also, Dr. Charles F. Poe, dean, College of Pharmacy, University of Colorado, Boulder; Dr. Harry Dowling, professor of medicine, University of Illinois, Chicago; Frank W. Abrams, former chairman of board, Standard Oil Co., New York; H. Gregory Thomas, president, Chanel, Inc., New York City; Lee W. Minton, president, Glass Bottle Blowers Union, AFL, Philadelphia; Patrick T. Stone, U. S. District Judge, Wausau, Wis.; and Mrs. Grace Nicholas, executive director, General Federation of Women's Clubs, Washington, D. C.

Fat and Color Problems

Investigation of edible fat replacements for cocoa butter in ration chocolate bars and coatings has been cited by the QM Food & Container Institute for the Armed Forces as pertinent for research contract study.

Also targeted is development of means to improve stability of rations by preventing color degradation.

New Mammoth Milk Evaporator

—gets final check by officials of Henszey Co., Watertown, Wis., before heading east for installation in Borden plant, Arcade, N. Y. Unit is capable of processing 75,000 lb. of milk per hour. Each of its two sections contains 2.75 miles of stainless steel tubing. Installed, machine will be 27 ft. long, 30 ft. high, and 13 ft. wide. Complete weight is 70,000 lb., of which 40,000 represent stainless steel.

FDA Resumes Disputed Grain Inspections

Checks of interstate-shipped wheat for such contaminants as rat pellets will now be resumed by FDA.

This decision comes after two years of discussion between USDA and Health-Education-Welfare. Lapse in the checks dates to the time when H-E-W officials acceded to USDA requests that such FDA inspections be discontinued as too stringent.

Wheat had been judged by FDA as contaminated when one rodent pellet was found per pint of grain in samples taken from nine or ten parts of a car of grain.

Primarily spotlighted here were the Government's wheat stores—a situation which might have proved embarrassing. However, present USDA thinking is that the enforcement procedures are no tougher than they should be.

Country elevators, from which the grain moves into commerce, stand as the points of action. But there is a chance that the responsibility may be carried another step back—to the farmers. For USDA is thinking of changing the rules for granting loans to farmers on grain: If the grain doesn't meet the standards—no loan.

It's estimated that some 2 or 3% of the grain now moving in interstate commerce might be liable to FDA seizure. But some 50 million bushels of wheat are consumed each month in food, and it's practically an impossibility for the small corps of FDA inspectors to check any considerable part of such an amount.

The Government's own holdings run to some 900 million bushels—which it hopes to put into normal commercial channels.

One means of stepping up the checking job would be to make FDA's pellet-in-a-pint standard a part of USDA's own grade standards. This, in effect, would add the services of numerous Commodity Credit Corp. inspectors in the routine.

Tropical Flavors in Ice Cream

Such fruits of the tropics as mangoes (several varieties), also guava, orange, and lichee, lent their flavors to ice creams that were sampled at Florida State Horticultural Society's recent meeting at Miami Beach. Used in creams were sauces prepared by Dr. W. A. Krienke, Florida Agricultural Experiment Station scientist. He has spent much time investigating dairy products as outlets for state's fruits. Shown trying varigated mango ice cream are (l. to r.) William Wooten and W. W. Carmichael, respectively v.-p. and president of Florida Mango Forum.

Problems Still Hobble Cold Sterilization

Recent research indicates that radiation sterilization of foods is not yet a practical reality.

Flavor change in irradiated foods is one of the prime problems, declared O. F. Ecklund of American Can Co. at a recent meeting of the New York Section of the Institute of Food Technologists.

Varying degrees of off-flavor were noted in meats, fish, shellfish, dairy products, fruit, vegetables, and preserves. These effects can be reduced but not eliminated by irradiating foods in the frozen state.

Another problem relates to destruction of enzymes which produce spoilage. They are inactivated by irradiation, but the doses required are excessive. Thus, this technique tends to increase off-flavors and costs as well.

Naturally, radiation sterilization is fully advantageous only where it does the whole job. It tends to become uneconomically involved where both irradiation *and* cooking (for enzyme inactivation) are necessary. Such is the case with fruits, vegetables, and fish. But with meat, the enzyme problem is less serious, and it is here that the new technique seems to show most promise.

Still to be overcome are adverse changes in texture and color, as well as storage deterioration. And other obstacles to commercial utilization are particular problems of engineering, cost, and public health.

Butter Buying Skipped

For the first month since Dec. 1952, USDA purchased no butter for price support in December. This compares with buying of 11,023,897 lb. in Dec. '53.

Cheese and nonfat dry milk purchases were also down. Former was 1,284,768 lb.; latter 11,190,090 lb., as against 6,903,727 and 36,583,631, respectively, in Dec. '53.

Estimated quantities on hand at end of year were: Butter, 265,673,345 lb., cheese, 334,829,074 lb., nonfat dry milk, 91,808,496 lb.

New Bulk-Flour Carriers Double as Storage Units

New economies in time, labor, and capital investment are seen garnered by bulk-handling bakers' flours in "Truck-A-Bin" units, just announced by the Flour Div. of General Mills, Inc., Minneapolis.

The special bins are permanently mounted on heavy-duty truck trailer chassis. Arriving at a user's plant, they serve directly as sanitary, weather-proof storage facilities. And they save space and expense by eliminating the need for in-plant storage units.

Each will hold 250 cwt. of flour, or one-fourth as much as the average bulk freight car. And two built-in, drop-bottom, screw-type conveyors make unloading automatic.

Further advantages cited: (1) Only a small electric motor is required for unloading, (2) the unit can be quickly adapted to any off-track plant, and (3) it can transport flour in bulk from any mill, public siding, or flour depot.

As a company service, General Mills will soon make the design and the system available in the baking field. Fruehauf Trailer Co. of Detroit, which closely cooperated in the development, will handle sale and leasing of the units throughout the U. St.

Poultry Conference Slates Wide Range of Topics

Among subjects specially spotlighted at the Fact Finding Conference of the Instiute of American Poultry Industries—underway at Kansas City, Mo., as this issue goes to press —are the following:

New production techniques to improve grades of market poultry. . . . The dollar-and-cents story of interior egg quality. . . . Egg quality improvement potentials and limitations.

Production and marketing effects of the commercial caged layer movement. . . . New methods for reducing in-plant costs. . . . Savings through an egg-products laboratory service. . . . Trends of inspection, and progress on the uniform sanitation code.

Minimizing grade losses. . . . New techniques in bleeding and killing. . . . Trends in cooling and freezing, with accent on packaging needs. . . . And the potential market for pre-cooked and frozen poultry.

Smaller Canning Tomato

Tomatoes of 1½ in. dia. are seen replacing the present large Pearson variety for canning. So says G. C. Hanna, University of California plant breeder.

"A main objection to the Pearson," declares Hanna, "is its large, hard core. To overcome this, coreless hybrids have been developed. But they won't stand up well in field-to-cannery transit. Hence, best answer is seen in a smaller fruit that will easily shake loose from the vines."

Hanna foresees savings in the canning process resulting from the smaller size fruit—among them elimination of coring, a hand operation. He is presently developing such a hardy, high-yielding tomato for mechanical harvesting.

Hors d'Oeuvres

▶ Yukon's gold rush gave a needed lift to the then struggling canned evaporated milk business. Wonder what uranium will do for instant milk?

▶ Sale of nearly three billion bushels of corn to Western Germany has been arranged. Couldn't have a more rugged ally than a corn-fed Deutschland.

▶ Modern hospital dietitians deal with hunger as a psychophysiological state, and with eating as a psychosocial process. Always thought the nurses handled the psychosocial angles.

▶ A hosiery premium failed to sell a soup mix. An unhappy association, like the overalls in Mrs. Murphy's chowder.

▶ Russians very much want the surplus butter we've long had stashed way in storage. Serve 'em right if they get it.

▶ Hear this beverage yarn? An old man spent his declining years developing a new drink called "6-Up", only to die broke after it flopped. The tragedy is that he never knew how close he came.

▶ Alcoholism can't be blamed on dietary deficiencies, nutritionists say. Maybe it is just a penchant for convenient calories.

▶ Beer may have made Milwaukee famous. But, with a little help from the Braves, good eating keeps it that way.

▶ Plans to increase milk-truck loads recently brought threat of strike from a New York teamsters local. About time drivers realized that either the load or the milk has to be concentrated.

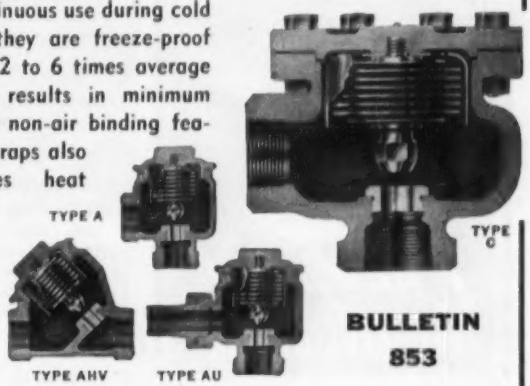
▶ Attempts to peddle pre-squeezed fresh Florida orange juice flopped a quarter of a century ago. Now this product is going places—thanks to new citrus know-how from concentrate operations. Progress sometimes does backfire.

NICHOLSON MAKES

Freeze-Proof Steam Traps

for every Plant Use

Because they drain completely when cold, these four types of Nicholson steam traps are positively freeze-proof. Can be freely installed outdoors. Universally recommended for use in lines which need not be in continuous use during cold weather, because they are freeze-proof and because their 2 to 6 times average drainage capacity results in minimum heat-up time. The non-air binding feature of Nicholson traps also notably facilitates heat transfer in severe weather. Types for every plant use. Sizes ¼" to 2"; pressures to 300 lbs.



BULLETIN 853

193 OREGON ST., WILKES-BARRE, PA.

W. H. NICHOLSON & CO.

TRAPS · VALVES · FLOATS

PRE-PLAN WITH Robo-Lift FOR PROFITS

There is no one "best" answer to *all* materials handling problems involving free-flowing solids and granulars.
That's why Counsel's specialized experience in this important field can be of such practical value in developing the handling system and equipment that will increase your plant's efficiency — make substantial savings in your operational costs . . . and reduce production delays to a minimum. Robo-Lift Elevating Conveyor systems are now in use with such diversified products as hardware, cake mixes, marshmallows, manganese dioxide, chocolate confections, etc.
If you want to modernize an existing line, expand your facilities, or apply automatic handling to manual operation, check Robo-Lift's many advantages. We'll be glad to discuss the application of Robo-Lift methods and equipment to your problem.

Please write for details.

COUNSEL MACHINE COMPANY, Inc.

8 Hathaway Street · Wallington, N. J.

For more information, use coupon on last page.

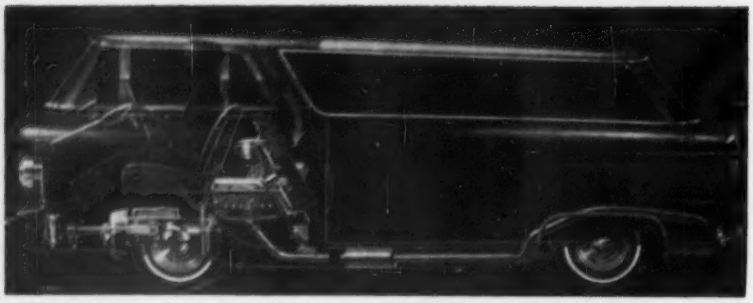
YOUR FROZEN CARGO
is
SAFE
10,550 lbs.
IN A DORSEY
Champion!
REFRIGERATOR VAN
..and you carry more

The lightest and toughest refrigerator van on the market today is the Champion, made by Dorsey's insulated van experts. At times, two of every three vans on our assembly lines are insulated vans, proof of Dorsey know-how. And proof that smart shippers know where to order refrigerator vans for their valuable cargoes.

TO CARRY MORE PAYLOAD
AND CARRY IT SAFELY
SEE YOUR DORSEY DISTRIBUTOR

DORSEY TRAILERS
SALES-SERVICE

or contact:
DORSEY TRAILERS
Elba, Alabama



Panel Truck of Tomorrow

Food industry truck operators are currently getting an intriguing look at what General Motors conceives as the panel-type vehicle of tomorrow (see illustrations).

Called L'Universelle, indicating an all-purpose design, a preview model of the machine has been on display at GM's New York Motorama Show in the Waldorf-Astoria Hotel. And it will make subsequent appearances in Boston, Miami, Los Angeles, and San Francisco.

Outstanding feature of the truck is its front-wheel drive through an inverted Hydra-Matic transmission incorporated with 180-hp. engine positioned immediately behind and beneath the driver's seat (top photo). As shown by arrows, the canted radiator is cooled by air from a roof intake.

General maintenance of the power unit—checks on battery, oil, water, and transmission—is through an access panel behind seat. An additional panel opens through load wall to carburetor, generator, fan belt, and sparkplugs.

Elimination of the conventional rearward driveshaft has permitted body design for greater capacity than current models of comparable length. Load-floor height is but 13 in. And drop-center rear axle gives more room in the low-slung body.

Doors to load compartment are extra-ample (see detail drawing, upper left in photo at right). Side doors open to a height of 46 in. and width of 48 in., folding upward on a 4-bar hinge. And rear door is 38¼ in. high by 44 in. wide.

Safe operation is emphasized by forward position of driver's seat and elimination of hood. A large panoramic windshield increases visibility for driver. And combination of front-wheel drive with short wheelbase provides exceptional maneuverability and more positive control on turns. Finally, the display model includes a two-way radio telephone enabling driver to keep in touch with plant.

18 Companies Honored For Good Management

Recognition for outstanding management performance in 1954 has been won by 18 companies processing food and kindred products.

This is a rise from 1953, when 12 concerns of the food field were given the Certificates of Management Excellence by the American Institute of Management. These are the 18—

Multi-category: Beatrice Foods Co., Chicago; Borden Co., New York City, General Foods Corp., White Plains, N. Y.; Jewel Tea Co., Barrington, Ill.; National Biscuit Co., New York City; Quaker Oats Co., Chicago; and Swift & Co., Chicago.

Bakery products: American Bakeries Co., Chicago. *Beverages:* Coca-Cola Co., New York City; National Distillers Products Corp., New York City. *Confectionery and related products:* American Chicle Co., Long Island City, N. Y.; Life Savers Corp., Port Chester, N. Y. *Dairy products:* National Dairy Products Corp., New York City.

Grain-mill products: Allied Mills, Chicago; General Mills, Minneapolis; Kellogg Co., Battle Creek, Mich. *Sugar:* Great Western Sugar Co., Denver. *Miscellaneous:* Corn Products Refining Co., New York City.

Companies are scored on ten key factors: Economic function, corporate structure, health of earnings, fairness to stockholders, directorate analysis, research and development, fiscal policies, production efficiency, sales vigor, and executive evaluation.

Milk Use, Production Up

Americans consumed approximately 9 lb. more milk per person in 1954 than in 1953 according to USDA. Meanwhile, population increase accounted for 1¼ billion lb.

At the same time, production jumped to a total of 124 billion lb., but the increase was more than offset by the greater consumption.

Dairy Support Prices Carrying On to '56

Dollars-and-cents support prices for manufacturing milk and butterfat, and current buying prices for butter, cheddar cheese, and nonfat dry milk will be continued through the 1955-56 dairy marketing year which begins Apr. 1.

Support prices are being continued at $3.15 per cwt. for manufacturing milk and 56.2c. per pound for butter fat.

These are an estimated 80% of the modernized parity for manufacturing milk, and 77% of parity for butterfat—both as of early 1955. Each figure is up from the current 75% parity, because of a reduction in the parity index and a modernizing change in calculating parities for manufacturing milk, which was announced last April.

USDA Secretary Benson attributes the increase in parity to a decrease in production of dairy products along with an increase in consumption. Also, he added, CCC holdings of dairy products are far below the figures of a year ago.

Briefly . . .

● **NATIONAL CAN is acquiring two-thirds of the stock of Pacific Can and will offer to buy remaining shares. Former is rated as third biggest can producer, latter fourth. It's said transfer won't affect management. E. F. Euphrat will continue to head Pacific.**

● PEANUT PICTURE gets worse before it gets better. "Higher in price and harder to buy is the outlook in '55," says Charles F. Scully, president, Williamson Candy Co., Chicago, and spokesman for the NCA at a recent Washington Tariff Commission hearing. Additional peanut imports are sought to ease the strain.

● **MARGARINE RISE continues. First 11 months of '54 saw an output of 1,248,000,000 lb. as against 1,185,000,000 lb. for comparable period of '53.**

● RADIATION PROCESS bidding fair to be very feasible is killing of insects in grain. So said Dr. Ernest E. Lockhart, of MIT, at a recent New York meeting of the American Assn. of Cereal Chemists. Dose seen required for complete destruction of insects in all stages of development is but 10% of that needed to kill microorganisms.

● **BEER CANS reached their 20th birthday on Jan. 24—and specially marking the occasion was the all-time production record of 6.5 billion units in '54. Total output of cans for beer and ale over the two decades is gaged at 42 billion.**

Saves

TIME
MAINTENANCE
LABOR

. . . protects foods in process, too!

LA PORTE
FLEXIBLE STEEL CONVEYOR BELTING

Right for all food handling jobs—canning, freezing, pickling, dehydrating—tough, long-lasting LA PORTE Belting speeds processing, requires minimum servicing!

STEEL MESH CONSTRUCTION rolls with the punches, protects against loading impacts. FLEXIBILITY gives La Porte a tighter grip on friction drum . . . does away with creep, weave, jump . . . gives you perfectly flat surface for containers empty or filled. *Open Mesh* allows air to circulate around products in process, makes cleaning easier and faster. Resists heat, cold, steam. Find out how La Porte can step up your food handling efficiency.

Write your dealer TODAY for literature, prices!

LA PORTE MAT & MFG. CO.
BOX 124 LA PORTE, INDIANA

Low-cost marking attachment pays for itself in weeks...saves thousands of $ every year

ROLACODER Marking Machine imprints code-dates, lot numbers, brands, varieties automatically on cases and cartons

Eliminate manual marking of cases and cartons in your plant and save thousands of dollars in labor costs. Attach an inexpensive ROLACODER machine to case-sealer, conveyor or cartoner and let it do the marking job automatically. Compact, precision-made ROLACODER is friction-operated, self-inking—makes a single accurately located imprint on each carton to register with other copy. Uses quick-change rubber type or dies; holds 8-hour ink supply. Different models available for imprinting top, ends, sides of small or large cartons, cases, other packages.

Write for descriptive literature

Gottscho

ADOLPH GOTTSCHO, INC.
Dept. G, Hillside 5, N. J.

In Canada: **RICHARDSON AGENCIES, LTD., Toronto & Montreal**

Automatic
CODING, MARKING, IMPRINTING MACHINES

OLD FASHIONED METHODS

sometimes fail to meet today's requirements for continuous processing

RIETZ FREE LABORATORY TESTING SERVICE SOLVES MANY SIZE REDUCTION PROBLEMS

In pulping, crushing, shredding and fine disintegrating operations for many end results, and in the important by-products and waste recovery or disposal fields, consider—

RIETZ DISINTEGRATORS
RIETZ PREBREAKERS

We welcome your problems in disintegrating, pulping, shredding, pureeing, juice extraction, comminuting and the whole host of related processing operations.

Send sample of your product with your specifications for free laboratory testing, test samples and a full report. Or get in touch with ANY RIETZ OFFICE.

You'll never know what Rietz can do for you until you let us try... at our expense.

RIETZ MFG. CO. SALES AND SERVICE
MIDWEST: 205 West Wacker Drive • Chicago, Illinois
EAST: 1969 Bartle Avenue • Scotch Plains, New Jersey
SOUTH: Forsyth Building • Atlanta, Georgia

Rietz **MANUFACTURING CO.**
Santa Rosa, California

Whenever in food industry lightcolored and pure syrups are required

Waterwhite and brilliant liquors!

NORIT

Highly Activated Decolorizing Carbon

will give best results. There is a grade to suit every purpose!

AMERICAN NORIT COMPANY, INC., *Jacksonville 8, Fla.*
THE NORIT SALES COMPANY OF CANADA, 506, *Church Street, Toronto, Ont.*
UNITED NORIT SALES CORPORATION LTD., *Amsterdam, Holland*

Schedule of Events

February

11–13—Institute of American Poultry Industries, annual conference; Kansas City, Mo.
14–16—American Management Assn., personnel conference; Palmer House, Chicago.
15–18—Western States Meat Packers Assn., annual meeting; Palace Hotel, San Francisco.
16—National Red Cherry Institute, annual meeting; Morrison Hotel, Chicago.
18—National Pickle Packers Assn., winter meeting; Drake Hotel, Chicago.
18–19—National Preservers Assn.; Morrison Hotel, Chicago.
19–23—National Canners Assn., National Food Brokers, Canning convention and annual meetings; Conrad Hilton Hotel, Chicago.
28-M4—American Bottlers of Carbonated Beverages, plant training course; Bellevue Hotel, San Francisco.

March

3– 4—Dairy Industries Supply Assn., annual meeting; Edgewater Beach Hotel, Chicago.
6—Bakery Equipment Manufacturers Assn.; Edgewater Beach Hotel, Chicago.
7–10—American Society of Bakery Engineers, annual meeting; Edgewater Beach Hotel, Chicago.
8– 9—Dairy Engineering Conference; Michigan State College, East Lansing.
10–11—Tri-State Packers Assn., spring meeting; Haddon Hall, Atlantic City, N. J.
13–16—National Assn. of Frozen Food Packers, National Wholesale Frozen Food Distributors Assn., annual convention and exposition; Conrad Hilton Hotel, Chicago.
17–19—Pacific Dairy & Poultry Assn., annual meeting; Hotel Utah, Salt Lake City, Utah.
20–23—National Sanitary Supply Assn., annual convention & exposition, Convention Hall, Atlantic City, N. J.
28–30—American Management Assn., manufacturing conference; Palmer House, Chicago.

Unique New Milling Unit For Whole Grain Flour

"Whole of the Wheat" flour, in which the oil and starch cells are said to remain intact, is produced by a revolutionary new milling machine at F. W. Stock & Sons, Inc., Hillsdale, Mich. And bread is being made from the flour by Waltham's Bakeries, Oxford, Mich.

By means of a revolving vertical cylinder, the new unit throws the grain centrifugally against a series of high-speed saws. And the teeth break the grain up into flour by impact, the grain making about 70 passes over the saws in an automatically timed, 4,000-lb.-per hr. operation. Bran particles adhere to the starch, and because the breaks are "clean-cut" the edges are reported to be smooth.

Because the oil and starch cells are not ruptured and development of

rancidity is retarded, exceptional keeping quality is attributed to the flour. This permits larger-quantity shipments to bakers. And the 100% whole wheat bread is said to retain moisture so well that its shelf life runs several days.

Infestation does not develop in the flour because larvae are destroyed by the impact that breaks up the grain.

In baking, the whole-cell structure of the flour requires longer hydration, and fermentation takes 2½ hr. Higher dough-mixing speeds are needed, and more yeast and sugar are used in the formula to attain the desired proteolytic action. The bread has a rich, "wheaty" flavor.

The new milling method was developed over a 15-yr. period by Whole Grain Products Co., Cleveland.

USDA Shorts

Frozen Strawberries: Additional grade designation considered for frozen strawberries is Class "C" or "Standard." This would be interjected in present three grades—"A" or "Fancy," "B" or "Choice," and "Substandard."

Eggs: Proposed changes for grading shell eggs are being considered with a view toward abolishing the separate classification "Stained" eggs. Accordingly, eggs with stained or soiled shells would be incorporated into the "B", "C", or "Dirty" classifications.

Weight classes would become more uniform between respective grades, and within weight or size classes. "Large" eggs must weigh individually at 24 oz. per dozen, with no more than a 5% tolerance for eggs weighing between 21 and 24 oz. per dozen. A uniform spread of 3 oz. per dozen in each weight class—"Extra Large", "Large", "medium", and "small" — would be required.

Proposed revisions (1) establish grading and packing procedures for eggs to be graded, (2) prescribe the grade mark, and (3) make minor changes in similar provisions contained in poultry grading and inspection regulations for consistency. Most changes will go into effect Jan. 1, 1956, though some are looked for earlier.

USDA & FDA Standards

Recent Government-agency actions affecting the food industry include following. References are to issues of *Federal Register*.

Canned vegetables, FDA amendments to Standard of Identity to allow use of monosodium glutamate as optional ingredient (proposed, Nov. 6 *F.R.*, p. 7228) now to go into effect (Dec. 24 *F.R.*, p. 9186).

Canned carrots, minimum recommended drained weights in USDA's Agricultural Marketing Service Standards amended (Jan. 15 *F.R.*, p. 363).

—End—

Wet Spent Grain

—Continued from page 32

screen that have 1-mm. perforations.

Pressed grain is then continuously transferred to worm-screw conveyors feeding two gas- or oil-fired rotary dryers (1,200-1,600 deg. F. at front ends and 220-250 F. at back).

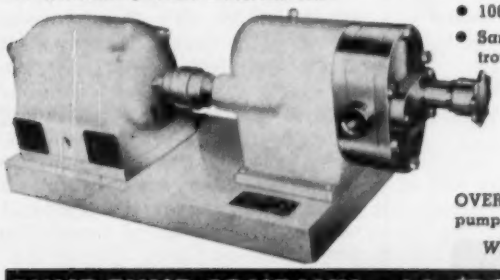
Because the drying schedule is so far ahead of brewing operations, one dryer is kept operating for only two shifts, while the other runs but 1½ shifts.

From the dryers, grain is pneumatically conveyed into a cone-shaped collector, from which it drops into a 100,000 lb.-capacity storage bin.

Movement of the dried material from the storage bin is either one of two ways, depending upon whether it is to be bagged in 100-lb. lots or bulk-shipped in box cars. In case of a bulk

BUMP PUMPS *with Sanitary Controlled Flow*

Used by leading food processors of vegetable products, fruit juices, jellies, jams, soups, meat products, glucose, chocolate, etc.



- 100% Stainless Steel pump
- Sanitary Rotary Seal for long trouble-free life
- Non-agitated, non-pulsating flow
- Only 2 moving parts in pumping chamber, easy to clean

OVER 40 YEARS of making BETTER pumps. Dealers everywhere.

Write for detailed information

BUMP PUMP COMPANY • LA CROSSE, WISCONSIN

What's the flavor of your food products? That's a hard question since flavor changes not only with the product, but also with each step in processing.

With this thought in mind, our research department conducts continuous, exacting tests of Victor Belting under actual operating conditions. Result: your guarantee of easily – yet completely – cleaned belting with no chance of residual food contamination or imparting of "belt-taste." That's why – with complete confidence – we recommend for *your* food handling:

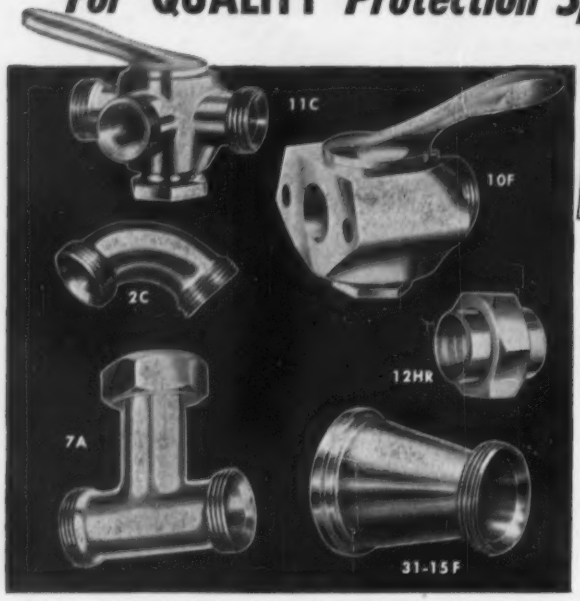
VICTOR SUPRENE special-woven cotton duck belting thoroughly impregnated with an exclusive Neoprene compound. Water-proof, highly resistant to grease and most food chemicals, smooth-surfaced, and easily cleaned.

VICTOR 475 highest quality, solid-woven cotton belting impregnated and coated with a special Neoprene compound. Developed for use where laboratory cleanliness is a *must*. Washable with hot water or steam. Resists rancidity and deterioration.

A COMPLETE LINE including: • Hycar Belting • Neoprene Belting • Balata Belting • Solid-Woven Belting – Untreated, impregnated, coated – many widths and plies • Canvas Stitched Belting • Belting Specialties

Victor
Balata & Textile Belting Co.
53 Park Pl., N.Y. 7 • 300-6 W. Hubbard St., Chicago 10
Factory, Easton, Pa.

For QUALITY Protection Specify...



G AND H

Sanitary Valves & Fittings

- Stainless Steel Holding Tubes
- Centrifugal Pumps
- Sanitary Specialties

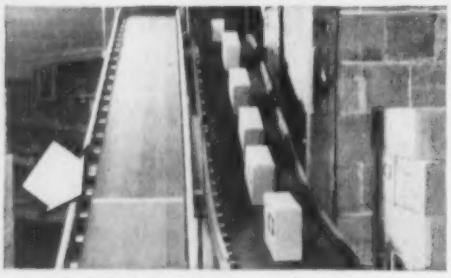
Send For New General Catalog

G AND H PRODUCTS CORPORATION

2413 52ND STREET • KENOSHA, WISCONSIN

ALLIGATOR

CONVEYOR BELT LACING



Every Tooth A Vise

in Long Continuous Lengths . . . made of Stainless or Monel for Food Plants

- ★ Excellent for flat conveyors, package conveyors, portable loaders, etc.
- ★ In canneries where corrosion or rust is a problem specify Alligator made of Stainless or Monel.
- ★ For magnetic separators or anti-sparking specify Alligator made of Everdur.
- ★ Separable and smooth on both sides.
- ★ 12 sizes. For belts from 1/16" to 5/8" thick—and any width.

Order from Your Supply House. Ask for Bulletin A-60

FLEXIBLE STEEL LACING CO., 4646 Lexington St., Chicago 44, Ill.

JUST A HAMMER TO APPLY IT

shipment, grain is worm-screw conveyed to a chute feeding a bulk-car loader that evenly fills the car.

As for bagging, grain is fed to an automatic bag filler and stitcher. Continuing onto a 12-ft. electric hoist-operated rubber-belt conveyor, bags are transferred to either the 1st or 2nd floor for storage (3,000 sacks).

As needed, bagged, dried grain is fed onto a spiral chute for truck- or box-car loading.

End (Resume reading on page 98)

Controlled Drying

—Continued from page 111

faces are exposed for easy cleaning. Furthermore, there are practically no ledges on which dirt or filth can accumulate.

Continuous Dryers

Short-cut macaroni products, such as elbows, shells, alphabets, and noodles, can be dried on trays in rooms such as that described for long goods, or in stationary drawers. However, modern method of drying these products is in continuous dryers equipped with moving screens through which air is forced.

Drying time for short products is 5-16 hr., depending on size and wall thickness of the product. And for noodles it's 5-12 hr. In this country, both short cuts and noodles generally are produced at rates of 600-1,200 lb. per hr. on continuous presses or sheet formers. Therefore, dryers must be designed to handle this volume of goods.

Same requirements for good drying apply to short goods and noodles as to long goods. However, methods of accomplishing effective drying are different with continuous equipment. Our basic line of short cut noodle dryers consists of a preliminary dryer approximately 24-ft. long and two finishing dryers each 41-ft. long.

Such a setup normally handles about 1,000 lb. per hr. of products such as elbow macaroni and shells, and varying quantities of products having different densities and drying requirements. Other combinations of preliminary dryer and finishers can be used for drying from 600 to over 2,000 lb. per hr.

As with long goods rate of drying short goods and noodles is a compromise with the theoretical, due to practical limitations of depth of goods on the traveling screens and amount of air that can be forced through the goods.

Because of physical restrictions of the equipment, it is necessary here to

set up a system involving: (1) Preliminary dryer, in which goods are given a relatively short treatment with dry air to remove a little moisture; (2) a belt, located at the top of the first finishing dryer but isolated from its air circulation system, to permit a slower process involving first a "sweating" period; (3) four drying screens in finisher No. 1; (4) a conveyor for transfer to a spreader on finisher No. 2; (4) a sweating belt at the start of finisher No. 2; and (5) four additional drying screens.

Theoretically, sweating belts would not be required if the moisture level were brought down evenly throughout the entire drying cycle. But air circulation is not perfect and the drying rate is not exactly even. Therefore, sweat belts provide a respite from drying, during which the moisture in the goods distributes itself evenly throughout the body of the goods and relieves any stresses set up by too-fast drying.

Counterflow Principle

Air circulation is one of the most important features in successful operation of these units. They are designed for counter-flow of goods and air.

Moist goods come in at the top and rest first on the top screen. Eventually they cascade down through the dryer from screen to screen, becoming driest on the bottom screen. Meanwhile, flow of air is from the fan at the bottom up through the dryer screens, and out at the top.

Therefore, relatively dry air hits relatively dry goods. It gains moisture as it passes up from screen to screen until it hits the top screen, at which point relatively moist air strikes relatively moist goods. Effect of air circulation is to bring moisture down evenly without shocking the goods too much.

Air circulation in short-goods and noodle dryers is provided by means of forced-draft fans with backwardly curved blades. These are the same type as used in forced draft furnaces. The fans have characteristics such that when pressure is built up, they still force air through the goods.

Heat is provided in an air conditioning unit attached to the side of the dryer that contains the conveying screens. This chamber also houses the fans and the exhaust and intake dampers. One of the primary functions of the conditioning unit is to provide a chamber in which circulating air and heated fresh intake air, can be thoroughly mixed before striking the goods. This prevents stratification and shock, which result when goods are struck by air that is too dry or too moist.

The heating coil is a special finned-tube type which has distributing tubes within the main tubes of the coil. These distributing tubes spread steam over the entire surface of the coil to provide heat over the whole width of the unit rather than just at one end. In the normal type of heating coil, steam is introduced at one end. Therefore, one end of the coil is generally a little warmer than the other, which results in undesirable stratification. Distributing tubes prevent this.

Air is exhausted from the top of the air conditioning unit. Fresh air is brought in through one side, where it can be thoroughly mixed before entering the dryer cabinet proper.

Dry bulb control is normally provided by pneumatically operated indicating controllers supplying compressed air to operate a modulating steam valve. Wet bulb control is by a similar control that supplies compressed air to operate damper motors on the intake and exhaust dampers.

And, as with the batch-type dryer, this unit likewise fills the need for easier cleaning. There is always an accumulation of flour dust which, if untended, provides a too-comfortable breeding ground for weevils and confused flour beetles. Therefore, sidewalls of the unit have been made removable. This permits access to the edges of drying screens and behind baffles for thorough periodic cleaning.

End (Resume reading on page 113)

Selecting a Sanitarian

—Continued from page 96

is more than 80% of any sanitation program. Insecticides and fumigants are, for all practical purposes, useless in areas where dust, dirt, and other accumulations are present.

Sanitation is a day-by-day task, not an occasional house cleaning job. You have a responsibility to give the consuming public a wholesome, unadulterated product. Select your sanitarian with that thought in mind, and then give him the tools and cooperation he needs.

The above article is from a paper presented at the recent Arizona Bakery Sanitation Seminar sponsored by the Phoenix Public Health Department.

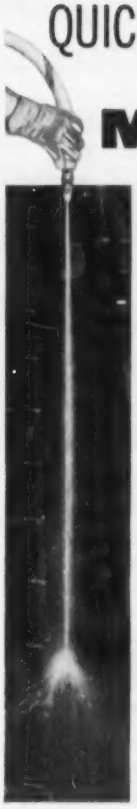
End (Resume reading on page 97)

Orange Concentrate

—Continued from page 71

In this new plant, the freshly extracted juice is frozen in a Votator to a slurry, which is then pumped to a basket centrifuge, where a fractionation of approximately 15% by weight supernatant (ester phase), and 85% by

QUICK CLEAN-UP
WITH
METSO®

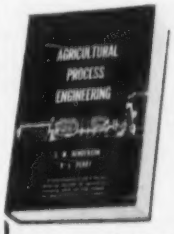


Metso Cleaner is geared to fast methods. Use Metso in steam gun cleaning. Dissolves quickly, removing oil, grease and proteins. Special component also controls corrosive effect of alkali on metals.

Get free copy—"Cleaning in Food Industries".

METSO® CLEANERS

PHILADELPHIA QUARTZ COMPANY
1148 Public Ledger Bldg.
Philadelphia 6, Pa.



Just Published:

AGRICULTURAL PROCESS ENGINEERING

By S. M. HENDERSON *and* R. L. PERRY, both of the University of California

This timely and highly informative new book treats the engineering viewpoint in its relation to agricultural processing. It is mainly concerned with the series of "unit operations" or steps in any processing operation that are or can be done on the farm or by local enterprise.

It provides a comprehensive description of the engineering elements of agricultural processing which, when properly understood and used, can help increase the yield of specific raw farm commodities. Unit operations discussed include such processes as cleaning and sorting, air conditioning, mixing, drying and dehydration, refrigeration, and many others.

The book contains material which has been prepared from a basic standpoint, and many of the topics have been treated descriptively.

A volume in The Ferguson Foundation Agricultural Engineering Series

1955 402 pages Illustrated $8.50

Send for your ON-APPROVAL copy today

JOHN WILEY & SONS, Inc.
440 Fourth Avenue New York 16, N. Y.

Farquhar
power-belt and gravity
Package Handling
CONVEYORS

BEST FOR YOU

They're best for you because they maintain high records of quality, performance and customer satisfaction. Get the facts about Farquhar Conveyors. Write for Bulletin No. 400 today!

OLIVER
Farquhar
CONVEYORS

THE OLIVER CORPORATION
A. B. FARQUHAR DIVISION
Conveyor Dept. F-59, York, Pa.

Frick Refrigeration Holds Shrimp Freezer Aboard the "Bubbie & Zadie" at -18°C.

This up-to-the-minute shrimp boat, designed for extended voyages, catches, processes, and freezes shrimp with facilities installed on board. When the boat makes port, its freezer storage hold is filled with 5-lb. packages of fresh-frozen shrimp which command a premium price at the wharf.

It will pay you to investigate this profitable idea that is catching on in the shrimp industry everywhere. A Frick freezer of this type pays for itself in no time at all.

Get in touch with your nearest Frick Distributor, or write directly to us for further information and quotations.

FRICK CO.
WAYNESBORO, PENNA. U.S.A.

weight effluent (ice phase) is effected.

Since esters are oils, they don't become entrapped in the ice crystal to any great extent and, therefore, virtually all of the flavor of the oranges is retained in the supernatant.

A typical Brix of the ester phase is 30 deg. Thus the 15%-by-weight of this phase contains 40-50% of the fruit sugars, practically all the volatile (flavor) oils, 60-70% of the citric acid, and most of the vitamin C. The ice phase (7-8 deg. Brix) will retain some of the fruit sugars and very little flavor.

Desired amount of pulp is added to the ice phase and the mixture is heat-treated to deactivate enzymes, then concentrated in a conventional high-vacuum, low-temperature evaporator to about 57 deg. Brix.

Ester phase is stored in a vaporproof cold-wall tank under nitrogen, then blended with the concentrate to give a 3-1 (42 deg. Brix) product.

"Our process" says Mr. Cook, "evaporates only the water, whereas the conventional method also removes much of the flavor. We can produce a 42 deg. Brix concentrate containing 100% of the fruit sugars (excluding process losses) and 93-95% of the flavor.

"The material admitted to the evaporator loses water more readily due to its initially low Brix. Also, it is unnecessary to recover oil from the peel for flavor fortification. These factors tend to offset the cost of refrigeration used to form the slurry.

Cost Increased Slightly

Analysis of operations at the plant indicates a cost differential of less than 0.0015c. per 6-oz. can above conventional processes."

Since the flavor is separated from the pulp before it is heat-treated, an almost complete enzyme inactivation can be effected. Consequently, gelation is avoided. (Gelation is caused by an enzymatic demethylation of pectins, even at temperatures as low as 20 deg. F. These pectins in turn react with the minerals present to form a jell.)

Most concentrate processors use some form of heat, such as supplied in a pasteurizer, to inactivate the enzymes on the juice fed to the evaporator, but do not heat-treat the "add-back" juice. In many cases, this juice has sufficient enzyme activity to cause severe economic loss of concentrate due to gelation when storage is at moderately adverse holding temperatures (15-20 deg. F.).

Golden Gift asserts there is a possibility of going to a higher Brix concentration in the final blend (58 deg. Brix, or 5-1) and still retain most of the flavor.

In 15 weeks of capacity operation of the Eustis plant early in 1954 it was found that, while there was an additional cost of refrigeration as compared with the "add-back" method, the evaporators were more efficient, removing 12,000 lb. of water per hour, as against 10,000 lb. in the conventional process.

Cost of the Votator, centrifuge, additional refrigeration, and connections —about $50,000—was compensated for by a 20% increase in plant capacity.

Golden Gift, Inc., plans to license its process to concentrate producers and to work with them on future developments.

End (*Resume reading on page 72*)

Pneumatic Molder

—*Continued from page 77*

Cylinders' piston rods, thus activated, then pneumatically force the molding board forward into position over the package.

Here, eight plunger-type "knock-out fingers" (also pneumatically operated) eject links from the mold and into a package. Board then returns to the feeding chamber, ready for the next cycle. The cycle is achieved by a series of air-vanes—"brains" of the machine —in the control unit.

Knock-out punch comprises plastic-coated metal fingers, which are warmed by a thermostatically controlled electric heater. This prevents meat from adhering to sides of the mold and thus consistently uniform weights are delivered to the packages.

The operator removes the open packages of uniformly shaped links from the carton magazine and passes them along the table to two girls, who quickly close them and pack them into a shipping case.

Finally, packages are taken into a 32-deg.F. cooler, where the links become firm in about 1 hr.

End (*Resume reading on page 78*)

Control of Quality

—*Continued from page 105*

turer to make more satisfactory shipments.

To check adherence of incoming ingredients to these specs, a laboratory must then be set up. As stated, this does not require much capital. Initial facilities might include an analytical balance, refractometer, pH meter, microscope, and vacuum oven. In time, additional equipment can be purchased. Even small pilot plant facilities can be included—for exam-

ple, a small cooking kettle to work out new formulas.

Now, with the laboratory established, close cooperation is essential so that it can promptly notify the receiving department of the status of incoming shipments. Upon receipt, incoming materials are visually examined, samples being checked against specifications.

Setting Up a Plant Program

Raw materials generally include sugar, corn syrup, starch, chocolate, gelatin, and nuts.

Sugar should be checked for color, invert sugar, and sediment; invert sugar for pH and solids; corn syrup for color, solids, sediment, and total reducing sugars; starch for moisture, fluidity number, and extraneous matter; chocolate for color, flavor, fineness, viscosity, and fat content; gelatin for sediment and bloom strength; and nuts (fumigated before entering the plant) for extraneous matter and compliance with U. S. grades and varieties.

Most significant raw-material test is for such offensive extraneous matter as dirt, molds, insects and their fragments, and rodent hairs and pellets, as well as foreign matter like pieces of wood, glass, or metal. And these must also be kept out of candies being manufactured. Such tests are first made visually, then microscopically.

Too, it would be a good idea for the chemist to taste-test raw materials to make certain they are not rancid, putrid, fermented, or off-odor (chemical or medicinal).

A finding by a new laboratory of insect fragments in excess of federal tolerances in a raw-material shipment brings quick rejection—saving management from the possibility of a lawsuit and adverse publicity. Similarly, in checking shipments of milk chocolate coating, analysis may show whole milk solids below the federal minimum of 12%.

Take another example—refined sugar. As for the amount of black specks in sugar, it varies from shipment to shipment. Yet, while not harmful, these specks do show up in white candies.

Also not to be overlooked are packaging materials, which should be tested for off-odor and contamination with foreign materials, as well as for the common physical properties like weight, thickness, dimensions, and bursting strength. Sources of contamination may include solvents, adhesives, and printing inks.

After assurance that ingredients meet specifications, next check is on in-process production. Here, too, standards must be established at those critical points where quality might be adversely affected. And it is a good idea to organize an inspection force.

These inspectors can report on sanitary conditions as well as carry out quality tests. They can be on the alert for dirt, foreign materials, and product infestation—also off-odors.

For example, accuracy of thermometers, scales, and steam pressures in the cooking department should be checked. At depositors, board weights should be examined to maintain correct counts per pounds. Molding starch should be tested for moisture content and screening efficiency, which adversely affect candy and production schedules. Colors and flavors should be accurately apportioned for each batch. Enrobers should be adjusted to coat goods with correct amount of chocolate.

Drying rooms should be kept at right temperature and humidity. Pipe lines and storage tanks should be inspected for syrups, milk, fats, and chocolate. Further, there should be a daily examination of nut sorting and cleaning units, as well as magnets, metal detectors, screens, and filters.

Checking Finished Candies

Examining finished goods is the final check. Suppose the quality of a fudge is to be controlled. Then the chemist should analyze this candy for percentage of fat, sugar, corn syrup, invert sugar, milk, moisture, and nuts.

Gum goods are checked for stability, color, flavor, appearance, assortment, and count per pound, in addition to percentage of sugar, corn syrup, invert sugar, starch, and moisture.

As for boxed chocolates, appearance of the candies and packaging materials are first examined, then the flavor, assortment, and count per pound. Chocolate coating is checked for amount, quality, application, and proportions. And centers are finally analyzed for amount of sugar and corn syrup.

Let Workers Help

In time, the chemist can put plant personnel to work checking candy quality.

For example, a reliable worker can be assigned to measuring, into each polyethylene container, sufficient color and flavor for each batch of hard candies or cream centers. And the operator making gum goods can be easily taught to use a hand refractometer for determining the end point of the cook. Also the marshmallow maker can weigh gallon samples for accurately determining of the whipping peak.

End (Resume reading on page 105)

STEEL
quick delivery
Ryerson
Plates, Structurals, Bars, Sheets, Tubes, etc. Carbon, Alloy, Stainless Steels, Babbitt Metal.
Ryerson Plants: New York, Boston, Philadelphia, Charlotte, N. C., Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles, San Francisco, Seattle, Spokane.

FRICK Refrigeration
Freezes 11 tons of shrimp, stores 50 tons, and makes 15 tons of ice daily for the Mariscos Congelados del Pacifico, S.A., at Guaymas, Sonora. This is one of the many ice plants, breweries, quick-freezers, dairies, packing houses, cold storages, hotels and restaurants in Mexico which find Frick refrigeration and air conditioning the ultimate answer to their cooling problems.
Let us quote NOW on the cooling system YOU need.
DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA. U.S.A.
Frick 7" x 7" Compressors at Guaymas

Recent Inventions

PRODUCTS

Ammonium Arabate from Natural Exudate Gum by Reacting in Water with Carboxylic-Type Synthetic Resin Exchanger Treated with Ammonium Hydroxide—*D. N. Adams, Lakewood to Harris-Seybold Co., Cleveland, Ohio. No. 2,694,057. Nov. 9, 1954.*

Cleaning Composition Containing Water-Soluble Anionic Organic Sulfate and Sulfonate Detergents, Sulfonamide Compound, 10-60% Water-Soluble Inorganic Phosphates—*A. I. Gebhart, Union, N. J. and I. J. Krems, Bronx, N. Y. to Colgate-Palmolive Co., Jersey City. No. 2,692,235. Oct. 19.*

Cleansing Composition Consisting of Soap and Anti-Bacterial Agent —*P. Lipsitz, Forest Brook Glen, to E. I. du Pont de Nemours & Co., Wilmington, Del. No. 2,-692,862. Oct. 26, 1954.*

Maraschino Style Cranberries by Bleaching Punctured Fruit, Leaching until Berry pH is 3.8-3.9, Evacuating, Blanching, Dyeing, Syruping—*K. G. Weckel, Madison and J. E. Welch, Newark, N. J., to Wisconsin Alumni Research Foundation, Madison, Wis. No. 2,692,831. Oct. 26, 1954.*

Floor Cleaner Comprising Non-Paraffinic Oil Extract Distributed on Pulverulent Carrier—*C. C. Weeks, Long Beach, Ont., Canada to The Patent & Licensing Corp., New York City. No. 2,692,861. Oct. 26, 1954.*

Ready-to-Eat Cereal Biscuit Comprising Dried Fruit Enclosed by Crisp Cereal Shreds—*C. H. Gager, Scarsdale, to General Foods Corp., New York City. No. 2,-693,419. Nov. 2, 1954.*

Solidified Honey Product Containing 45% Honey Solids, Gelatinized Starch—*W. F. Straub to W. F. Straub & Co., Chicago. No. 2,693,420. Nov. 2, 1954.*

Edible Container for Frozen Confection Comprising Molded, Baked and Toasted Mixture of Cereal Flour, 3-15% Hydrophilic Gelatinous Substance—*E. L. Washburn, Mundelein to Illinois Development Laboratories, Chicago. No. 2,694,012. Nov. 9, 1954.*

PROCESSES

Treating Edible Mushroom Mycelium with 2-25% Sodium Chloride, Aging to Enhance Flavor—*J. Szuecs, Yonkers, N. Y. No. 2,-693,664. Nov. 9, 1954.*

Picking Fowl by Applying Oppositely Directed Forces Over Adjacent Body Portions Permitting Skin to Cool, Continuing in Opposite Direction—*S. S. Barker and A. W. Sharp to Barker Poultry Equipment Co., Ottumwa, Iowa. No. 2,691,795. Oct. 19, 1954.*

Accelerating Beer Fermentation by Adding to Barley Wort, .01-2% Defatted Soybean Solids, 0.1-1.25% Liquid Yeast (16.5% Solids), Holding at 32-68 F—*R. O. Weber, St. Paul to Archer-Daniels-Midland Co., Minneapolis, Minn. No. 2,692,199. Oct. 19, 1954.*

Blanching Whole Vegetables Continuously by Surrounding with Steam in Agitating Zone, Then Controlling Advance Through Non-Agitating Section—*H. M. Olsen, Wauwatosa to Chain Belt Co., Milwaukee, Wis. No. 2,692,-200. Oct. 19, 1954.*

Improving Gelatin Whipping Properties by Adding Aliphatic Carboxylic Acid Ester—*L. J. Conrad, Collingswood and H. S. Stiles, Merchantville, N. J. to Kind & Knox Gelatin Co. No. 2,692,201. Oct. 19, 1954.*

Vanillin From Alkaline Reaction Mixture by Continuously Supplying Gas With Oxygen Partial Pressure Below 6.6 psi.—*C. C. Bryan, Seattle, Wash. to Monsanto Chemical Co., St. Louis, Mo. No. 2,692,291. Oct. 19, 1954.*

Cutting Cheese Into Small Blocks by Moving Large Piece Through Frame Opening, Contacting Cutting Wires.—*G. H. Kraft, Wilmette and J. Riemer, Chicago to Kraft Food Co., Chicago. No. 2,692,430. Oct. 26, 1954.*

Processing Cheese by Centrifuging Whey, Retaining Curd, Lifting from Rotating Bowl, Cutting—*B. T. Hensgen to Swift & Co., Chicago. No. 2,692,832. Oct. 26, 1954.*

Improving Unsaturated Fatty Acids by Heating With Catalyst in Inert Atmosphere to 284 F Maximum—*J. J. A. Blekkingh, Rotterdam, Netherlands to Lever Bros. Co., New York City. No. 2,692,886. Oct. 26, 1954.*

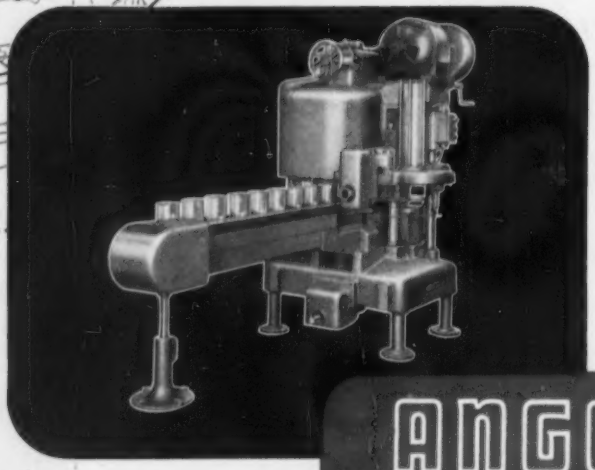
Pressurized Whipped Cream by Filling Container with Compatible Gas at 75 psi., Injecting Cream Droplets at 100 psi., Closing—*E. W. Smith, Melrose Highlands, Mass. No. 2,693,418. Nov. 2, 1954.*

Drying Yeast to Inactivate Zymase and Preserve Lactase by Spray Drying Aqueous Dispersion at 130-310 F—*E. G. Vinson, Sayville to National Dairy Research Laboratories, Oakdale, N. Y. No. 2,693,440. Nov. 2, 1954.*

Agitating Fluids by Transmitting Sonic Waves from Generator Through Acoustical Connection—*A. A. Fowle, Waltham to Ultrasonic Corp., Cambridge, Mass. No. 2,693,944. Nov. 9, 1954.*

Isolating Proteolytic Enzyme and Suspended Matter in Ficis Latex

Swing to ANGELUS
CAN CLOSING MACHINES



FOR
Lower Investment
Lower Maintenance
Higher Production

Welcome

to Angelus Booth No. 2 at the Annual Canning Machinery and Suppliers Association Convention. Chicago, Illinois – February 19-23.

ANGELUS
Sanitary Can Machine Company
Cable Address "Angeliaco" Western Union Code
4900 Pacific Boulevard • Los Angeles 58, Calif.

You a target?

Let's face it . . . we're all targets!

If your plant is not ready with a disaster plan, better act now. There's not a single American plant that's out of range of an intercontinental bomber—and fires, floods, tornadoes or explosions can kill you just as dead as an atom bomb.

It costs next to nothing to take a few simple steps which may save hundreds of lives. Here they are. Check them off today.

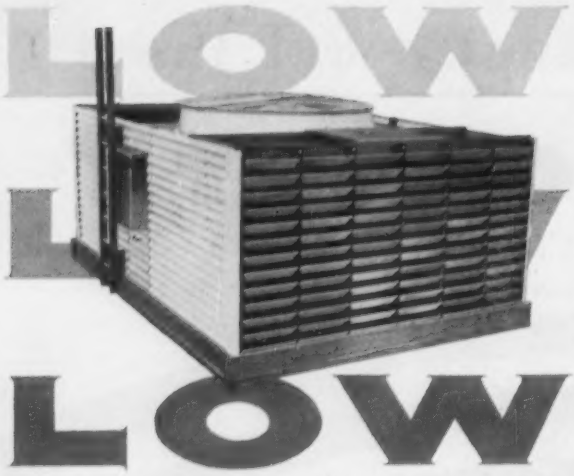
☐ **Call your local** Civil Defense Director. He'll help you set up a plan for your offices and plant—a plan that's safer, because it's integrated with community Civil Defense action.

☐ **Check contents** and locations of first-aid kits. Be sure they're adequate and up to date. Here, again, your CD Director can help. He'll advise you on supplies needed for injuries due to blast, radiation, etc.

☐ **Encourage personnel** to attend Red Cross First-Aid Training Courses. They may save your life.

☐ **Encourage your staff** and your community to have their homes prepared. Run ads in your plant paper, in local newspapers, over TV and radio, on bulletin boards. Your CD Director can show you ads that you can sponsor locally. Set the standard of preparedness in your plant city. There's no better way of building prestige and good community relations—and no greater way of helping America.

Act now . . . check off these four simple points . . . lives are at stake . . . have you a right to delay?



...AND BEHOLD!

THE

1955 Double-Flow* Aquatower

The Marley Double-Flow Aquatower, the unit that brought the low silhouette tower to the air conditioning and refrigeration industry, has been completely redesigned . . . to accentuate its compatability to architecture, to boost its already excellent performance.

New are the horizontal corrugated asbestos cement board end walls; new are the completely louvered sides. These two features give the Double-Flow Aquatower a much lower, more compact appearance and make the tower an integral part of the structure it serves. The new structural design effects marked economy in construction time and labor cost.

A distinctively different pattern of high-efficiency nailless filling is a 1955 feature. Air-handling ability of every Double-Flow Aquatower unit has been sharply increased. The combination of these two improvements means added performance for every frame size.

Double-Flow Aquatowers are offered in a complete range of capacities for either single or multi-cell installations. The Model 8 (pictured here) and its companion, the Model 12, fill every requirement for air conditioning and refrigeration. Get the entire story on these important improvements in water cooling from your nearby Marley engineering sales office.

*Trademark reg. Double-Flow design fully protected by U. S. Pat. Re 21794

MARLEY the Marley Company

Kansas City, Missouri

by Adjusting pH to 6-7, Centrifuging—*A. Walti, Fullerton, Calif. No. 2,694,032. Nov. 9, 1954.*

Degrading Unsaturated Higher Fatty Acids by Heating Their Alkali Metal Salts With Caustic Alkalies in Presence of Cadmium —*W. Stein and H. Hartmann to Henkel & Cie, G.m.b.H., Dusseldorf, Germany. No. 2,694,081. Nov. 9, 1954.*

Refining Fatty Oils Continuously by Decolorizing, Centrifuging, Neutralizing—*F. T. Palmqvist to Aktiebolaget Separator, Stockholm, Sweden. No. 2,694,082. Nov. 9, 1954.*

PACKAGING

Bag Filler With Height-Adjusting Holding Member, Funnel—*P. M. Davison, Caldwell, Idaho. No. 2,688,429. Sept. 7, 1954.*

Partitioned Food Platter Comprising Moisture-Resistant Interior Surface, Heat-Sealable Plastic Cover—*L. Brock, Philadelphia, Pa. No. 2,688,430. Sept. 7, 1954.*

Bottle Capper With Hydraulic Cylinder, Piston, Deformable Crimping Cup, Air-Operated Cylinder—*C. S. Price, Rutherford, N.J. No. 2,689,074. Sept. 14, 1954.*

Fruit-Shipping Container From Single Paperboard Cut Having Bottom, Side, End Panels, L-Shape Liners—*J. W. Main, Bellvue, Wash. to Container Corp. of America, Chicago. No. 2,689,077. Sept. 14, 1954.*

Molding and Dispensing Container for Gelatin-Containing Foods With Cavity Formed Between Walls of Low Cohesion Plastic for Easy Removal—*E. W. Colt to L. Peters, Evanston, Ill. No. 2,689,183. Sept. 14, 1954.*

Bottle Cap Position Detector Comprising Vertically Movable Holder Adapted to Ride Upon Annular Bottle Shoulder, Detector Member, Displacement Means, Control Switch—*J. H. Hofstetter, Downey and P. R. Wiewandt to Purex Corp., Ltd., Los Angeles, Calif. No. 2,689,647. Sept. 21, 1954.*

Tubular Thermoplastic Bag Having Rectangular Walls, Top and Bottom Transverse Ventilating Slits, Reinforcing Beads—*D. D. Wendt to Bemis Bro. Bag Co., Minneapolis, Minn. No. 2,689,678. Sept. 21, 1954.*

Closure Cap Comprising Inner, Outer Threaded Tubular Members, Cylindrical Stopper, Plurality of Apertures—*F. Hammer, Mannheim, Germany. No. 2,690,143. Sept. 28, 1954.*

Packaging Machine Comprising Frame, Rotatably Mounted Worktable, Spaced Dies, Plungers, Sliding Head, Sheet Feeding Mechanism, Feed Hopper, Tube—*P. A. Ketchpel, West Englewood and H. K. Egli, New Milford to Ketchpel Engineering Co., West Englewood, N. J. No. 2,690,634. Oct. 5, 1954.*

Fastening Means for Fiberboard Carton Having T-Shaped Tongue Extending From Flap, Central Stem, Lateral Wings—*K. S. Dawson, Southbury to Waterbury Corrugated Container Co., Waterbury, Conn. No. 2,690,286. Sept. 28, 1954.*

Forming Flexible Thermoplastic Wrapper by Heating Marginal Strip Through Non-Plastic Supporting Band, Removing When Tacky, Contacting Untreated Portion—*H. R. Denton, Oakland, Calif. No. 2,690,633. Oct. 5, 1954.*

Paper Bags Formed Continuously From Rectangular Sheet—*F. Luehrmann and E. Klein to Bischoff & Klein, Lengerich, Westphalia, Germany. No. 2,690,706. Oct. 5, 1954.*

Paste Applicator for Bagmaking Machine Containing Chamber, Roller, Transfer Sector, Journaled Bearings, Control and Power Means—*H. H. Weber, Sheboygan and J. O. Olsen, Milwaukee to H. G. Weber & Co., Inc., Kiel, Wis. No. 2,690,732. Oct. 5, 1954.*

Open-Ended Can Package With Inwardly Folded End Flaps Engaging Beads on Cans to Restrain Outward Movement, Inner Retaining Element—*H. M. Robinson to Armour and Co., Chicago. No. 2,690,839. Oct. 5, 1954.*

Pouring Bottle Cap Comprising Roof, Opening, Internal and External Spouts—*H. A. Schuler, Woodside, N.Y. No. 2,690,852. Oct. 5, 1954.*

Closure for Open-Head Drums Consisting of Curved Annular Flange, Expandible Annular Gasket, Locking Ring—*R. L. Kaye, Newark, N.J. No. 2,690,854. Oct. 5, 1954.*

Adjustable Filler Having Vacuum Head, Suction Means, Air-Tight Container Enclosure—*P. E. Fischer and M. B. Sturdevant to General Mills, Inc., Minneapolis, Minn. No. 2,690,865. Oct. 5, 1954.*

Filling Meat Into Stuffing Horns Under 29-in. Vacuum to Free Emulsion From Entrapped Air.—*M. Moses, Los Angeles, Calif. No. 2,690,970. Oct. 5, 1954.*

Adjustable Roll Mounting for Bagmaking Machine Having Frame, Vertical Slideway, Bearing Block, Cap, Threaded Adjusting Member, Flanged Collar—*A. J. Evers, Brooklyn to International Paper Co., New York City. No. 2,691,328. Oct. 12, 1954.*

Flap Folding Mechanism for Bagmaking Machine Comprising Rotor, Finger, Oscillating Means—*A. J. Evers, Brooklyn to Inter-*

national Paper Co., New York City. No. 2,691,329. Oct. 12, 1954.

Container for Fragile Cookies Having Open Top, Four Upright Walls, Plurality of Spaced, Edgewise Strips, Securing Means—G. C. Gettelman to C. A. Wilkinson, Milwaukee, Wis. No. 2,691,441. Oct. 12, 1954.

Egg Tray From Molded Pulp Sheet With Plurality of Spaced Hollow Support Posts, Receiving Pockets—E. L. Shepard, Fairfield to Keyes Fibre Co., Portland, Me. No. 2,691,456. Oct. 12, 1954.

EQUIPMENT

Can Bag Unloader With Receiving Mold, Outlet-Forming, Converging Side Walls, Movable End Wall to Discharge Cans in Tiers—A. M. Cameron, River Forest, and C. T. Walter, Markham, Ill. to Continental Can Co., New York City. No. 2,686,604. Aug. 17, 1954.

Sanitary Valve With Body, Coaxially Rotatable Plug, Discharge Passage, Positioning Pin, Wire Stop—E. Onosko, Kenosha to Tri-Clover Machine Co., Kenosha, Wis. No. 2,687,872. Aug. 31, 1954.

Screw-Type Continuous Mixer Comprising Shaft, Rotor, Stator With Spaced Annular Elements—T. J. Laurelton to E. T. Oakes Corp., Islip, N. Y. No. 2,687,877. Aug. 31, 1954.

Grain Distributor Having Hopper, Plurality of Radial Arms, L-Shaped Hangers, Rotatable Deflector—J. Kinsella, Merna, Ill. No. 2,687,892. Aug. 31, 1954.

Coffee Dryer Comprising First, Second Coaxial Rotating Drums, Annular Heating Space, Product Feed, Discharge—J. de Oliveira Torres, Sao Paulo, Brazil. No. 2,688,196. Sept. 7, 1954.

Liquid Level Device With Movably Mounted Tube, Expansible Gas Chamber, Vacuum Measuring Means—W. D. Kelly, Western Springs, Ill. No. 2,688,251. Sept. 7, 1954.

Motorized Psychrometer Having Tubular Handle, Wet, Dry Bulb Thermometers, Fan to Establish Air Stream—J. F. King Jr. to The Bahnson Co., Winston-Salem, N.C. No. 2,688,252. Sept. 7, 1954.

Scale With Tare, Net, and Gross Weight Indicators—R. B. Brown, Jr., San Francisco. No. 2,688,301. Sept. 7, 1954.

Fruit Pitter Comprising Conveyor, Fruit Holders, Slidably Mounted Rods, Pitting Plungers—G. W. Ashlock, Jr., Oakland, Calif. No. 2,688,352. Sept. 7, 1954.

Needle Bar Assembly for Meat Clamp Having Elongated Angled Bar, Plurality of Spaced Holes, Needle Elements, Engaging Screw—A. Van Duyn, Rotterdam, Netherlands to U. S. Slicing Machine Co., Inc., La Porte, Ind. No. 2,688,353. Sept. 7, 1954.

Want more information on any of these recent patents? If so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you would like to receive and enclosing 25¢ for each copy.

Butter Churn Comprising Tilting Frame, Jacketed Rotatable Container With Hollow Wing, Feed, Discharge Openings—C. A. S. Thorstensson-Rydberg, Stockholm, Sweden to J. R. Andersson & Co. Aktiebolag, Sundbyberg, Sweden. No. 2,688,468. Sept. 7, 1954.

Poultry Shackle Having Support, Pivotally Mounted Jaws, Locking and Opening Device—A. W. Sharp and E. S. Crane to Barker Poultry Equipment Co., Ottumwa, Iowa. No. 2,688,765. Sept. 14, 1954.

Conveyor-Dryer With Vertical, Helical Vibrating Conveyor, Coaxial Baffle, Hot Air Supply—J. H. Ginther, Berea to Ferro Corp., Cleveland, Ohio. No. 2,688,807. Sept. 14, 1954.

Specific Gravity Indicator Comprising Calibrated Plastic Casing, Air Chamber, Float—F. J. Trainor, Holly Hill, Fla. No. 2,688,867. Sept. 14, 1954.

Surface Temperature Measuring Device With Suction Cup Base, Heat Transfer Liquid, Thermometer—R. H. Barnes, Ozone Park, New York. No. 2,688,876. Sept. 14, 1954.

Grain Probe Having Outer Barrel, Inner Rotatable Tube, Vertically-Spaced and Circumferentially-Staggered Openings—R. D. Peine, Minier, Ill. No. 2,688,877. Sept. 14, 1954.

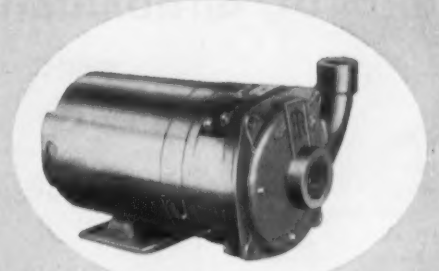
Pimiento Corer Comprising Endless Belt, Carrying Cups With Bottom Rotary Burr, Coring Device Above—E. White, Moultrie, Ga. No. 2,688,993. Sept. 14, 1954.

Rotary Vegetable Cutter With Elongated Casing, Plurality of Stationary Knives, Shaft Having Rotary Knives—V. Simon and R. Denis to Sides Societe Anonyme, Carnieres, Belgium. No. 2,688,994. Sept. 14, 1954.

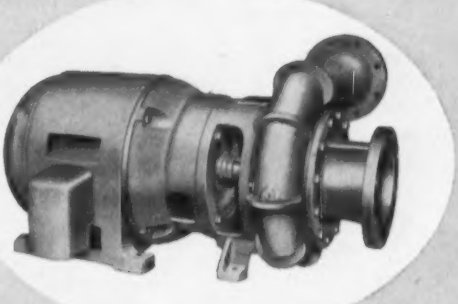
Water Softener Having Automatic Brine Regenerating System—H. C. Waugh, Drexel Hill to American Water Softener Co., Philadelphia, Pa. No. 2,689,218. Sept. 14, 1954.

Fowl Tendon Puller Comprising Support, Leg Holding-Jaws, Actuating Means—W. Macdonald, Seekonk, Mass. No. 2,689,371. Sept. 21, 1954.

5GPM or



2800GPM



MAKE IT MOTORPUMP

FOR MORE VALUE

You Get More for your Money with Motorpumps—Here's Why!

Motorpumps stay on-the-job for years with minimum or no maintenance.

Advanced design, continuous research, modern construction methods insure overall excellence.

Tough and strict quality standards imposed from casting to pre-package testing means you can install a Motorpump, start it, forget it.

Installation is easy. No special foundation or aligning is needed.

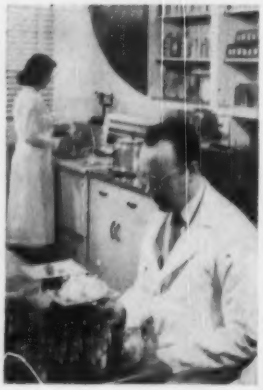
Space presents no problems. Motorpumps are notable for compactness. Find out more about Motorpumps and what their extra value will do for your profit picture . . . write today for Form 7093-D, or call your nearest Ingersoll-Rand distributor.

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N.Y.

Ad #9-123

Eastman offers widest range of antioxidants



If your food product needs protection against rancidity, bad odor or off-flavor caused by oxidative deterioration, Eastman can help you.

Eastman is the leader in food-grade antioxidants. The leader in volume . . . in experience . . . in accumulated data.

No other manufacturer can offer such dependable counsel in the proper use of antioxidants for the stabilization of foods.

The effectiveness of Eastman recommendations and Eastman Tenox antioxidants has been proved on the following products:

Animal Fats and Oils	**Cosmetics**
Vitamin A	**Monoglycerides**
Cereals	**Cookies**
Butter Fat Concentrate	**Essential Oils**
Fish and Fish Meal	**Citrus Oils**
Chewing Gum	**Potato Chips**
Meat Products	**Dog Food**
Crackers	**Premixes**
Paper Board	**Spices**
Dairy Products	**Wax**
Chicken Fat	**Candy**
Vegetable Fats and Oils	**Nuts**

Don't let rancidity cause returns, losses and dissatisfied customers. Look into the simple remedy of antioxidants. Their cost is low.

Eastman will be glad to recommend an antioxidant treatment or even undertake a testing program for whatever food product you wish to stabilize. The recommendations you receive will represent the most effective treatment at the lowest possible cost. For Eastman offers a full range of antioxidants and has no axe to grind in favor of any one antioxidant. We make them all!

For more information about Tenox, write to Eastman Chemical Products, Inc., Kingsport, Tennessee—a subsidiary of Eastman Kodak Company.

Tenox Eastman Food-grade Antioxidants

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tenn.; New York — 260 Madison Ave.; Framingham, Mass. — 65 Concord St.; Cincinnati — Carew Tower; Cleveland — Terminal Tower Bldg.; Chicago — 360 N. Michigan Ave.; St. Louis — Continental Bldg.; Houston — 412 Main St. **West Coast: Wilson Meyer Co.,** San Francisco — 333 Montgomery St.; Los Angeles — 4800 District Blvd.; Portland — 520 S. W. Sixth Ave.; Salt Lake City — 73 S. Main St.; Seattle — 821 Second Ave.; **Canada: P. N. Soden Co., Ltd.,** Montreal, Quebec — 2143 St. Patrick St.; Toronto, Ontario — 1498 Yonge St.

Blanket Coater for Depositing Edible Granular Material on Ice Cream in Cones—*W. J. Habgood, Upper Darby, Pa. to Eskimo Pie Corp. No. 2,689,544. Sept. 21, 1954.*

Drum-Lifter for Industrial Trucks Having Hook-Shaped Housing, Guideway Slot, Holding Member, Gripping Pawl—*L. C. Shramek, Stevensville, Mich. No. 2,689,663. Sept. 21, 1954.*

Extensible Dock Board With Frame, Side Members, Transverse Beam, Cross Member, Pivoted Roll-Over Surface, Elevating Means—*F. W. Fenton, St. Louis, Mo. to Beacon Production Equipment Corp., Centreville Township, Ill. No. 2,689,965. Sept. 28, 1954.*

Sausage Linker Comprising Frame, Guide Members, Swingably Mounted Arms, Rotatable Triangular Divider Heads With Plate-Like Slotted Portion—*L. P. Cross, Valparaiso, Ind. No. 2,689,972. Sept. 28, 1954.*

Curd Mill Having Frame Bars, Slidably Mounted Side Members, Connecting Rods, Separate Stripper Plates, Forming Hopper, Cutting Disks Mounted on Journaled Shaft—*W. G. Schulze to Damrow Bros. Co., Fond du Lac, Wis. No. 2,690,011. Sept. 28, 1954.*

Milk Cooler Comprising Tank, Inlet, Outlet Means, Chilling Wall, Baffle, Cold Water Sprays—*R. Markley to Dairy Equipment Co., Madison, Wis. No. 2,690,061. Sept. 28, 1954.*

Dough Sizer With Pair of Transversely Reciprocal Rods, Springs, Sizer Elements, Cams—*D. Whitehead, Oak Park to Anetsberger Bros., Inc., Northbrook, Ill. No. 2,690,142. Sept. 28, 1954.*

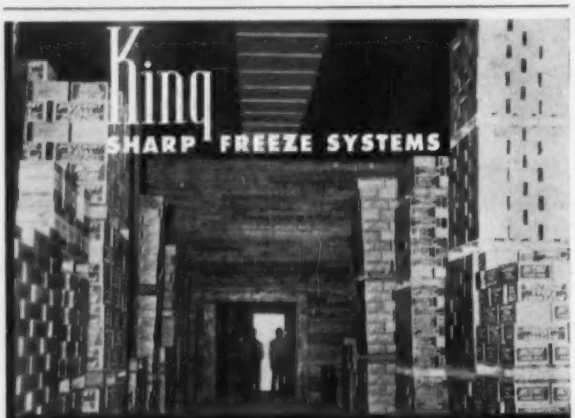
Power-Operated Nut Cracker Comprising Two Coaxially Spaced, Movable Annular Parts, Radial Knives—*J. S. Swearingen, San Antonio, Tex. and J. R. Barton, Dayton, Ohio to R. Mollison, San Antonio, Tex. No. 2,690,196. Sept. 28, 1954.*

Comminuter With Food Inlet, Tubular Slidable Barrel, Impeller, Drive Shaft, Plurality of Underside Discharge Openings—*G. W. King to Rex Mfg. Co., Grand Rapids, Mich. No. 2,690,197. Sept. 28, 1954.*

Tablet Counting, Inspecting, and Stacking Apparatus—*J. M. Schmied to Schulze & Burch Biscuit Co., Chicago. No. 2,690,257. Sept. 28, 1954.*

Heat Exchanger Comprising Two Independent Systems of Radially Disposed Communicating Passages—*W. J. Keesling, Anderson, Ind. No. 2,690,328. Sept. 28, 1954.*

Sausage Stuffer Having Cylindrical Casing, Piston, Alternate Suction and Pressure Applying Means—*M. Moses, Los Angeles, Calif. No. 2,690,589. Oct. 5, 1954.*

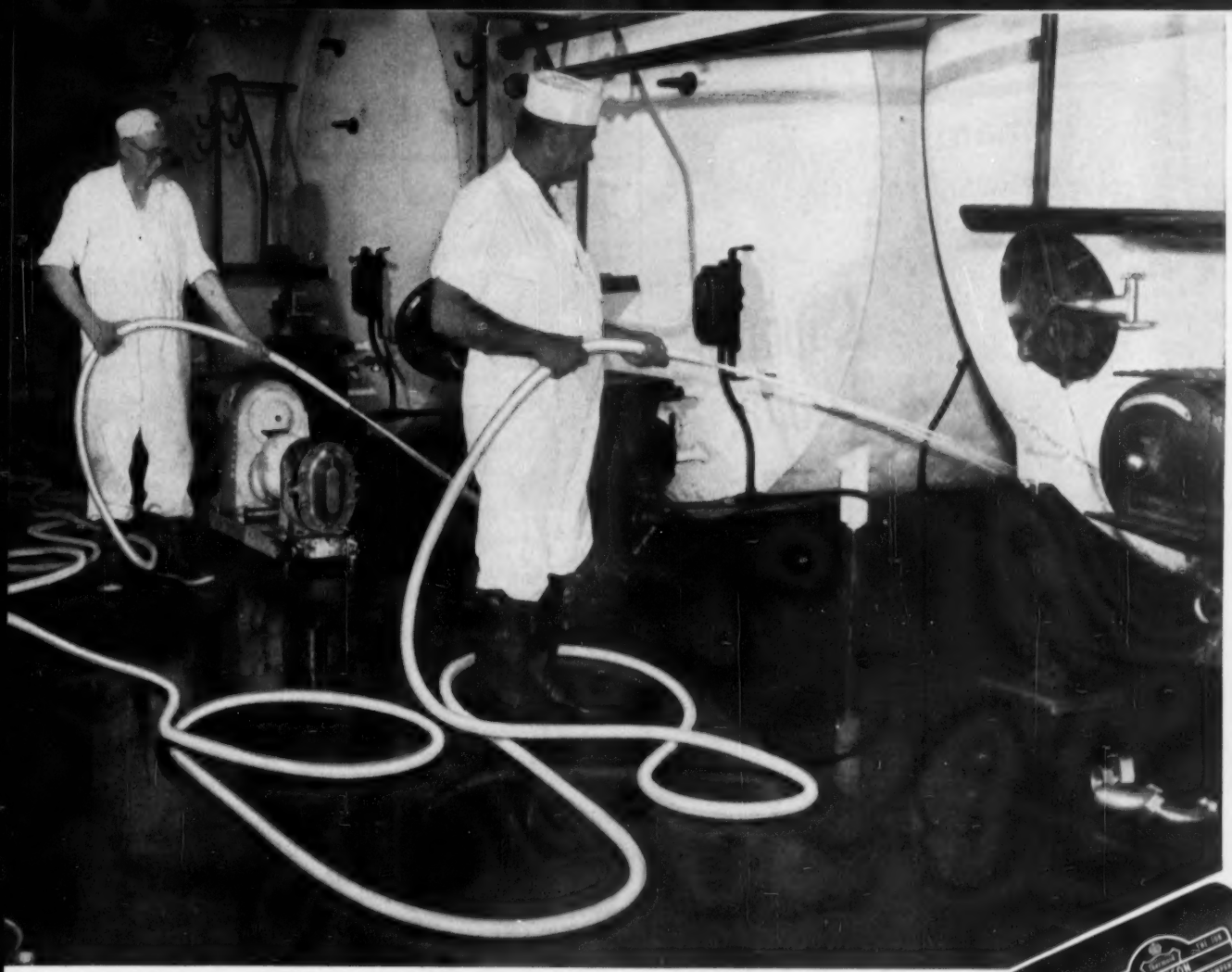


ENGINEERED FOR BIG JOBS . . .
with bigger Profits in mind!

More than 400 plant operators here and abroad have chosen King Systems for more efficient bulk freezing jobs for bigger profits. King Systems give you increased cold-room capacity, faster freezing, engineered distribution of air, continuous operation with no costly defrosting shutdowns, retention of product flavor and quality, lower power costs, a quick-freeze system designed for your specific needs.

Write for technical bulletins. More than 50 years experience is at your disposal.

THE King CO. OF OWATONNA
905 N. CEDAR ST. OWATONNA, MINNESOTA
MANUFACTURERS OF SHARP FREEZE, COOLING, VENTILATING AND HEATING SYSTEMS



Thermoid Hose designed specifically for use in food processing plants

Thermoid designs and manufactures many types of hose for a wide variety of specific industrial applications. These 3 are ideal for use in food and beverage plants:

VERSICON most versatile hose ever developed. Handles air, water, oil, gasoline, dilute acids and gases.

CREAMERY for use with hot or cold water and low pressure steam, for cleaning and sterilizing.

BREWERS for use in breweries, wineries and food plants. Imparts no taste or odor.

Your Thermoid Distributor carries a full line of Thermoid Hose, Conveyor Belting and Multi-V Belts to meet your most exacting requirements. He maintains complete stocks and can give you fast service. If you prefer, write direct.

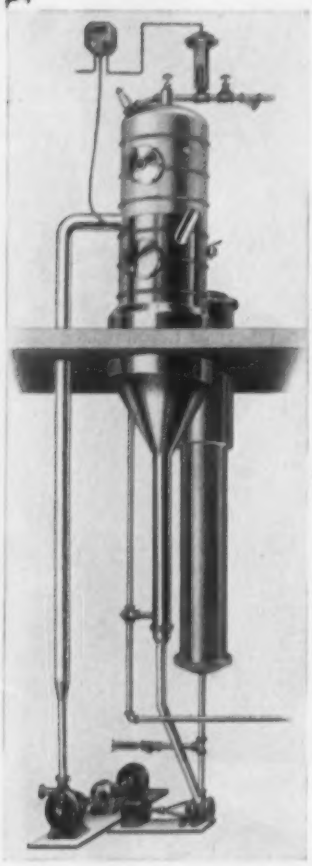
Thermoid

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

Tomato Puree process report:



Superior Color, Flavor

Mojonnier Tubular Evaporator, Model TF2, similar to that installed in large eastern tomato puree plant.

Concentrated puree far superior in quality and color to that obtained by the open kettle method, is the report of a large eastern tomato processor. After washing, pulping, and passing through a Mojonnier Tubular Heat Exchanger, the juice enters the Mojonnier Tubular Evaporator. This unit operates with a product temperature of about 135° F and produces as much as 1,400 gallons of puree per hour at a specific gravity of about 1.048. A vari-speed positive pump provides for continuous unloading of the Evaporator into one of three 1,000 gallon tanks, where the puree is standardized with raw juice to the desired specific gravity, depending upon the intended use.

● For complete information on this improved process for highest quality tomato puree, write today to:

MOJONNIER BROS. CO., 4601 W. Ohio St., Chicago 44, Ill.

QUALITY Mojonnier YOU CAN TRUST

TUBULAR EVAPORATORS

Mojonnier Engineered Equipment for the Food Industry includes: Vacuum Pans • Cold-Wall Tanks • Compact Coolers • Conveyors Zone-Control Vats • Evaporators • Tubular Heaters • Tubular Coolers • Milk Testers • Vacuum Fillers • Case Washers • Bulk Coolers • Bulk Tankers • Balance Tanks • Cut-Wrap Machines Overrun Testers • Culture Controllers • Processed Cheese Kettles Butter Print Scales

Men & Companies

Hans Erlanger, vice-president and general sales manager of Hunt Foods, Inc., has been elected to its board of directors and to the executive committee of the board.

Industry

Beatrice Foods Co. will acquire the wholesale ice cream business of **Louis Sherry, Inc.,** on Mar. 1.

Best Foods, Inc., has purchased "Skippy" brand peanut butter from the **Rosefield Packing Co.** of Alameda, Calif. and **Good Foods, Inc.**

Chicago Dressed Meat Co., Inc., has leased a recently completed meat terminal in the Bronx, N. Y. C.

Clark Dairy Ltd. of Ottawa, Ontario, is constructing a $1 million plant, expected to be completed in early fall.

Dixie Jelly & Syrup Co., Inc., of Ferndale, Mich., has been incorporated by Byron F. Cobb to make jellies and preserves.

Duquesne Brewing Co. of Pittsburgh plans to construct a $1 million brewery-bottling plant.

Fairmont Foods Co. of Omaha has purchased **Peerless Milk Products Co.** of Rock Island, Ill.

Falstaff Brewing Corp. is constructing three new grain storage bins with a total capacity of 2½ carloads at its plant in San Jose, Calif.

Guittard Chocolate Co. is building a candy plant in Burlingame, Calif. estimated to cost over $1 million.

Hawaiian Pineapple Co., Honolulu, announces construction plans for new facilities to manufacture tin cans.

Morton Packing Co. has purchased a new plant at Webster City, Iowa.

Nalleys, Inc., of Tacoma, Wash., has purchased the **Columbia Pickling & Packing Co., Inc.,** of Portland, Ore., producer of pickles and sauerkraut.

Pet Food will construct a new plant at Santa Clara, Calif. for an estimated $200,000.

S & W Fine Foods has broken ground for a $2 million office headquarters, coffee processing plant, and warehouse in San Francisco.

Sylmar Packing Co. of Los Angeles has been sold at public auction to industrial property developers.

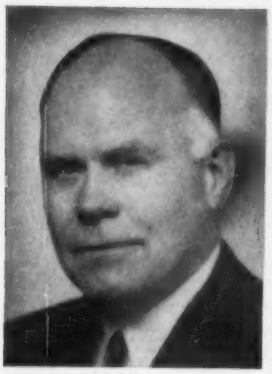
Transparent Package Co. of Chicago has changed the name of the organization to **Tee-Pak, Inc.**

Westgate-California Tuna Packing Co. of San Diego has separated its production and sales organizations into two corporations. The new company will be named **Breast-O'-Chicken Tuna, Inc.**

Personnel

William L. Abramowitz has been named vice-president of Borden Co.'s chemical division.

Hubert M. Cole has joined Firmenich, Inc., as technical director of the flavor division after 15 yr. experience in a flavor-research capacity with General Foods Corp.



Dr. R. H. Lueck, formerly general manager of American Can Co.'s research and technical department, has been elected vice-president in charge of the department. Dr. Lueck has been with the company for 32 yr.

W. C. Arkell, former vice-president of the board of Beech-Nut Packing Co., has been elected board chairman.

E. D. Atwater, treasurer of William Wrigley, Jr., Co., is a new director of the company.

Stephen J. Bartush, president of Shedd-Bartush Foods, Inc., Detroit, has been elected chairman of the board.

H. H. Corey, president of George A. Hormel & Co., has been chosen chairman of the board succeeding the late Jay C. Hormel.

Joseph B. Fasano has been elevated to manager of the San Francisco branch of Libby, McNeill & Libby.

Gerald A. Fitzgerald, recent food industry advisor to the government of Iran, has joined Donald K. Tressler & Assoc., as vice-president and general manager.

John J. Frank is new president of Frank Tea & Spice Co., succeeding Emil Frank, who has been named chairman of board.

Leonard F. Genz has been appointed secretary of General Foods Corp.

James E. Glover has been chosen president and general manager of National Cranberry Assn.

Sherwin Haxton, president of Haxton Foods, Inc. since 1925, has been elected chairman of the board of directors.

Earl G. Johnson has been named plant manager of the Chicago branch of the Wagner Baking Corp.

Harold G. Kazanjian, former treasurer, has been elected executive vice-president of Peter Paul, Inc.

David M. Keiser, president of Guantanamo Sugar Co., is now chairman of board.

Marie W. Layer has joined staff of Hines-Park Foods, Inc., Ithaca, as home economist in charge of the Duncan Hines test kitchen.

Joseph G. Lehman, vice-president of Nalley's, Inc., of Tacoma, Wash., has been appointed general manager of the company.

G. E. Mackey has been named vice-president and general plant manager of the Chicago plant of Armour & Co.

J. T. May has been appointed general manager of Grayslake Gelatin Co., Grayslake, Ill.

J. M. McGillis and **Paul Bienvenu** have been elected to the board of directors of Molson's Brewery Ltd.

Harold F. North, former industrial relations manager, is now in charge of developing special personnel projects for Swift & Co.

George C. Patton, formerly with Quaker Maid Co., has joined General Foods as head of product and process development.

Charles Ritz, president of International Milling Co., Minneapolis, has been chosen chairman of board.

Jerome Rosefield, former president of Rosefield Packing Co., has become v.-p. and general manager of Skippy Peanut Butter Div. of Best Foods, Inc. (see item under Industry).

Sydney J. Smith has been named president and general manager of William Neilson Ltd. of Ottawa, Canada.

Forrest Townsend has been appointed special educational consultant in the dairy division of the Vendo Co. after 15 yr. with USDA.

John T. Walsh, formerly assistant director of the American Dry Milk Institute, Chicago, has joined Dry Milks, Inc., Chicago, as v.-p.

Obviously

your product is superior
—make it obvious with

VIZ-PAK®

FABRICATED · VACUUM-FORMED · METAL BOTTOM · CARDBOARD DISC

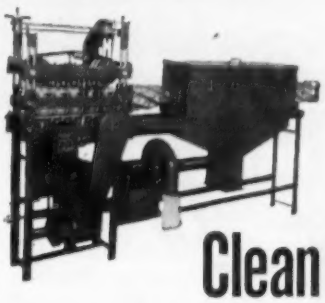
transparent plastic containers

WORLD'S LARGEST

J. E. PLASTICS MFG. CORP.
FOOD PROMOTION DIVISION
555 W. 23RD ST., NEW YORK 11

write today for new illustrated catalog

WORLD'S LARGEST SPECIALISTS IN SEMI-RIGID TRANSPARENT CONTAINERS



Clean Glass Jars

at a Lower Cost

A complete Jar Cleaning Line to handle wide-mouth jars or cans, blowing out the dust and other loose matter with air, or sterilizing with steam or a combination of these operations as desired. The machine is also available with water jets for thorough rinsing with hot water and preheating the glass well before filling, to minimize breakage.

Send for Special Bulletin and Prices.

The Best IN LABELING AND PACKAGING Equipment

Chisholm-Ryder
COMPANY OF PENNSYLVANIA
HANOVER, PENNSYLVANIA

FOOD INDUSTRIES

STOP *Costly* Floor Corrosion with HYDROMENT JOINT FILLER

• • • •

BRICK & TILE FLOORS ARE NO BETTER THAN THEIR JOINTS!

Save the critical 5% joint area represented by a one-eighth inch joint in a floor using 4" x 8" bricks and save your entire floor from costly corrosive damage prevalent in most food processing industries.

HYDROMENT JOINT FILLER has proved its resistance to corrosion in food industries for more than 16 years. Tight, waterproof, corrosive resistant, non-shrinking HYDROMENT joints assure durable, attractive brick and tile floors and walls.

Write for complete details and the NEW HYDROMENT COLOR CARD.

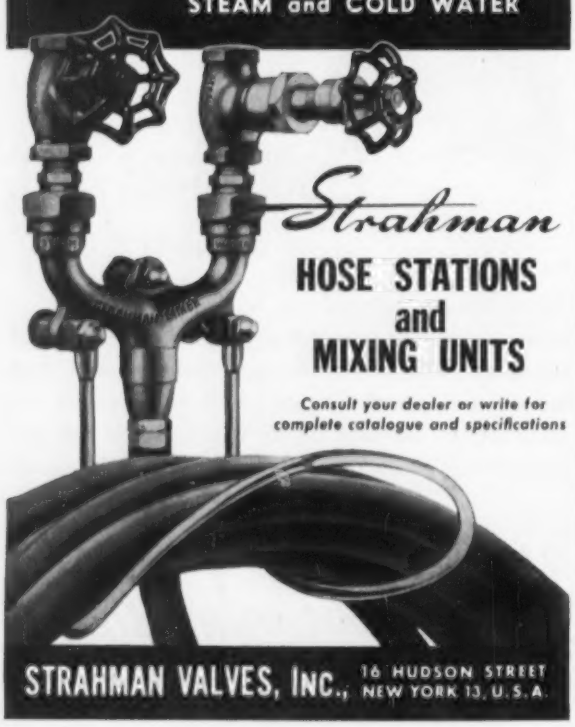
4805 LEXINGTON AVE. CLEVELAND 3, OHIO

THE UPCO COMPANY

PIONEERS IN INDUSTRIAL RESEARCH SINCE 1881

The ANSWER to YOUR WASH-UP PROBLEM!

HOT and COLD WATER
STEAM and COLD WATER



HOSE STATIONS and MIXING UNITS

Consult your dealer or write for complete catalogue and specifications

STRAHMAN VALVES, INC., 16 HUDSON STREET NEW YORK 13, U.S.A.

D. B. Wood, president of Wood Canning Co., has been elected president of California Processors & Growers, Inc.

C. R. Zimmermann has been named technical consultant to the National Preservers Assn. and member companies.

Associated Industries

American Can Co. has named R. C. Stolk vice-president in charge of its Pacific division and G. W. Reese vice-president of the Atlantic division.

American Seal-Kap Corp. has approved a plan to acquire capital stock of **United Can Co., Inc.,** and its subsidiary, **Hackettstown Paper Tube Co.**

Bemis Bro. Bag Co. has appointed C. C. Cobb resident manager of its St. Louis paper specialty plant.

E. W. Bliss Co. will build a can machinery plant near Hastings, Michigan which will be managed by Frederick B. Porteous.

Cochran Foil Co. has announced that Merrill A. Grogel will be its new product development manager.

Continental Can Co. has appointed Albert S. Redway general manager of research and development department of its paper container division.

Crown Cork & Seal Co., Inc., has elected Russell Gowans president of the company. He will continue as chairman of board.

A. E. Friedgen, Inc. has elected Arthur E. Friedgen, founder and former president of company, chairman of board.

Robert Gair Co., Inc. has announced acquisition of **Harvey Container Corp.** of Plymouth, Mich.

Mack Trucks, Inc., has named P. O. Peterson president and chief executive.

Manbert Paper Products Ltd. of Ottawa, Canada, is building a new $400,000 plant near Toronto.

Mealpack Corp. has elected H. W. Clarke, Sr. to the office of executive vice-president.

Midwest Canners, Inc., of Detroit, has been incorporated for $50,000 by Alfred Sher.

Edward W. Shineman, Jr., has been named a director of Beech-Nut Packing Co. of Canajoharie, N. Y. He is also assistant treasurer of company.

Revere Copper & Brass, Inc. has bought assets of **Standard Rolling Mills, Inc.**

Shock Gusmer Co. has been transferred from Hoboken, N. J. to the main plant of **Pfaudler Co.** in Rochester, N. Y.

Stockton Elevators, Inc., has been formed to operate a $2 million grain storage terminal now under construction in Stockton, Calif.

Sutherland Paper Co. announces that its new specialties division near Kalamazoo, Mich., is now in operation.

Deaths

Charles N. Dannals, Sr., 77, chairman of board and former president of Atlanta Milling Co.—Dec. 15.

Thomas C. Fulton, 72, vice-president, secretary, and a director of Anchor Hocking Glass Corp.—Jan. 7.

John A. Hafner, 62, vice-president of Wilson & Co., Inc.—Jan. 11.

Edward C. Johnston, 41, president of Robert A. Johnston Co. in Milwaukee.—Jan. 1.

Howard S. Paine, 74, former vice-president of Refined Syrup & Sugars, Inc. of Yonkers, N. Y.—Dec. 6.

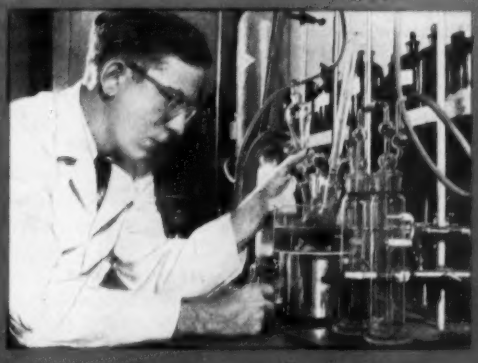
Paul J. Voss, 50, member of industrial sales & service division, California & Hawaiian Sugar Refining Corp.—Dec. 29.

Fred J. Wood, 45, vice-president of Crown Cork & Seal Co., Inc., Baltimore.—Dec. 19.

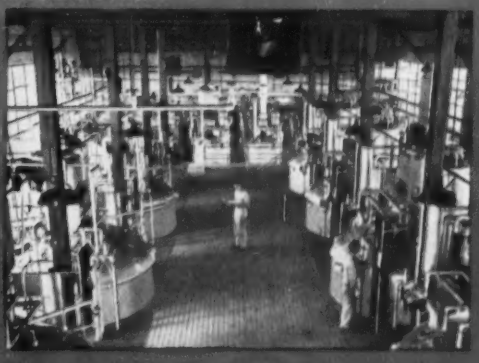
SALES

TECHNICAL SERVICE

RESEARCH



PRODUCTION



Use these specialists to create

NEW PROFIT OPPORTUNITIES

Today's consumers are nutrition-minded and open-eyed, yet cost conscious. To survive under these circumstances, a food product needs to offer something *extra*. If you are developing a new product, or must cut production costs on a staple, it will pay you to call in the Merck team. Here's what they have to offer:

SALES—Individual Merck representatives are specialists in cereal chemistry, vitamin technology, baking technology, meat packing, freezing, canning, and bottling. Through well-developed team play, your problem gets to the right man fast.

TECHNICAL SERVICE—The Merck technical service staff knows the food industry from albumin to zwieback. In addition, it can bring the Company's entire technical and scientific resources to bear on problems relating to the developing, manufacturing, analyzing, or labeling of food products.

RESEARCH—The Merck staff of research chemists is one of the country's largest. From this creative group have come major discoveries in vitamins and other scientific developments—with many practical and potential food applications. Merck customers, of course, are the first to enjoy these advances.

PRODUCTION—Merck is the world's foremost producer of vitamins and a major source of fine chemicals for the food industry. Through the years customers have come to rely on the purity, uniformity, and dependability of every Merck product they buy.

Research and Production
for the Nation's Health

MERCK

MERCK & CO., INC.
Manufacturing Chemists
RAHWAY, NEW JERSEY

© Merck & Co., Inc.

For more information, use coupon on last page.

Just Off the Press

NEW CATALOGS AND BULLETINS: SEND FOR YOUR COPIES BY ENCIRCLING NUMBERS ON READER SERVICE CARD

PLANT ENGINEERING

Spray Nozzles

Nozzles and accessories for industrial, air conditioning and special applications with complete tables of performance ratings.—*Delavan Mfg. Co., Grand Ave. & 4th St., West Des Moines, Iowa. (220A).*

Steam, Air Traps

Information and illustrations of steam and air traps.—*G. E. Squires Co., 18502 Syracuse Ave., Cleveland 10, Ohio. (220B).*

V-Port Valves

Description of valves for control of steam, water, vacuum, and propylene glycol. Bulletin 344-V. —*Powers Regulator Co., Skokie, Ill. (220C).*

Lab Items

Fifty laboratory items of polyethylene described and illustrated, with price list. 8 p.—*Scientific Glass Apparatus Co., Inc., Bloomfield, N. J. (220D).*

Jet Apparatus

"Jet Apparatus and Its Industrial Applications" discusses characteristics, varieties and ranges of items. Bulletin J-1.—*Schutte & Koerting, 2223 State Rd., Cornwells Heights, Bucks County, Pa. (220E).*

Electric Starters

Folder illustrates and describes air-break electric starters.—*Electric Controller & Mfg. Co., 2700 East 79th St., Cleveland 4. (220F).*

Power Equipment

Pumps, motors, transmissions, cylinders and valves described and pictured. Bulletin 10051-D. 12 p. —*Oilgear Co., Milwaukee 4. (220G).*

Compact Unit

Operating procedure and features of compact unit for controlling solution temperatures described. 4 p.—*Pako Corp., 1010 Lyndale Ave. N., Minneapolis. (220H).*

Scientific Equipment

Description, illustrations and prices of many types of scientific equipment. Catalog 54-11-56. 19 p.—*Burrell Corp., 2223 Fifth Ave., Pittsburgh 19. (220I).*

Factory Supplies

Supplies of all types for the meat industry listed, with prices. 31 p.—*Koch Supplies, 2520 Holmes St., Kansas City 8, Mo. (220J).*

Steam Vacuum Pump

Single stage steam jet vacuum pumps applicable for filtration, distillation, mixing, heating, vacuum transfer and vacuum packaging. Bulletin 5-E. 7 p.—*Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa. (220K).*

Pneumatic Transmitter

Technical bulletin explains balanced pneumatic transmitter, for measuring flow, level and differential pressures in water filtration and sewage plants. Folder 285-L2. 4 p.—*Builders-Providence, Inc., 345 Harris Ave., Providence, R. I. (220L).*

Gear Units

High-speed gear units discussed. Catalog HI-542. —*Philadelphia Gear Works, Erie Ave. & G St., Philadelphia 34. (220M).*

Vertical Pumps

Sectional drawings, dimensions and installation views of vertical multi-stage pumps in service. Form 7096. 12 p.—*Ingersoll-Rand Co., 11 Broadway, New York City 4. (220N).*

Silicones

Reference guide for products of silicone.—*Dow Corning Corp., Midland, Mich. (220O).*

Hydraulic Ramps

Information on use and installation of hydraulic adjustable ramps for leading docks.—*Rowe Methods, Inc., 2534 Detroit Ave., Cleveland 13. (220P).*

Mechanical Tubing

Finishes, size ranges, types and shapes of stainless tubing. Folder TB 365. 6 p.—*Babcock & Wilcox Co., Beaver Falls, Pa. (220Q).*

Steel Sheaves

Description of carbon and alloy cast steel sheaves, wire rope fittings, and accessories. Catalog 22. 4 p.—*Farrell-Cheek, Sandusky, Ohio. (220R).*

Valves, Fittings

Engineering specifications and cross-sectional pictures of line of valves and fittings. Bulletin 8. 8 p.—*Alloy Steel Products Co., Inc., Linden, N. J. (220S).*

Facing Tile

Specifications and description of ceramic glazed structural facing tile. AIA File 10-B. 4 p.—*Metropolitan Brick, Inc., 1019 Renkert Bldg., Canton 2, Ohio. (220T).*

Plastic Pipe

Technical data on general purpose corrosion-resistant plastic pipe. Folder 80-A. 6 p.—*American Hard Rubber Co., 93 Worth St., New York City 13. (220U).*

Wire-Rope Assemblies

Safe-lock wire rope assemblies with variety of applications described. Catalog 5201. 22 p.—*Macwhyte Co., Kenosha, Wis. (220V).*

Stainless Steel

Information on steel's corrosion resistance, applications, and working characteristics.—*Carpenter Steel, Union, N. J. (220W).*

Centrifugal Pumps

Illustrated data on design and construction of industrial and sanitary pumps.—*G&H Products Corp., Kenosha, Wis. (220X).*

Thermocouple Elements

General application information on line of thermocouple elements and bare thermocouple wire. Form 14-15-54. 4 p.—*Claud S. Gordon Co., 3000 S. Wallace St., Chicago 16. (220Y).*

Drives, Controls

Line of drives and controls described. Booklet FE16-L.—*Reeves Pulley Co., Columbus, Ind. (220Z).*

Electric Hoists

Line of air and electric hoists for handling bulk materials discussed. Form 5300-A. 44 p.—*Ingersoll-Rand Co., 11 Broadway, New York City 4. (220AA).*

Speed Drive

Description of variable speed drive with graphs and photos. Bulletin K-100. 4 p.—*Cleveland Worm & Gear Co., 3249-59 80th St., Cleveland 4. (220AB).*

Application Ideas

Booklet "Original Equipment Application Ideas for Product Designers" offered. Release 1054-23. 12 p.—*Gast Mfg. Corp., Benton Harbor, Mich. (220AC).*

D.C. Motors

Industrial direct current motors discussed.—*Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland 10. (220AD).*

Pumps

Features of variety of pumps discussed, illustrated.—*Hypro Engineering, Inc., 404-10 Washington Ave., N. Minneapolis 1. (220AE).*

Industrial Fans

Selection tables to choose right fan for required capacity included. Catalog EX-531. 28 p.—*Bayley Blower Co., 1817 S. 66th St., Milwaukee 14. (220AF).*

Liquid Pump

Illustrations and description of rotary liquid pumps for refrigerant transfer and recirculation. Circular 424. 4 p.—*Vilter Mfg. Co., Milwaukee 7. (220AG).*

Jet Syphons

Application of steam and air jet syphons which utilize pressure energy to pump, heat and mix. Brochure 2-A. 24 p.—*Schutte & Koerting Co., Cornwells Heights, Bucks County. (220AH).*

Processing Machines

Line of food processing equipment includes new products. Catalog 3363.—*Buflovak Equipment Div., Blaw-Knox Co., 1575 Fillmore Ave., Buffalo 11, N. Y. (220AI).*

Fluid Couplings

Installation and performance data on fluid couplings. Bulletin 144-D. 14 p.—*Twin Disc Clutch Co., Racine, Wis. (220AJ).*

Sanitary Pumps

Explanation and selection charts of steel sanitary pumps.—*Creamery Package Mfg. Co., 1243 W. Washington Blvd., Chicago 7. (220AK).*

Automatic Controls

Illustrated description of automatic control equipment.—*Zenith Electric Co., 152 W. Walton St., Chicago 10. (220AL).*

Rubber Products

Performance data, specifications, and sizes of industrial rubber products explained.—*Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Tacony & Comly Sts., Philadelphia 24. (220AM).*

Screening

Line of screening equipment for removal of solids from water, sewage and industrial waste described. Book 2587. 28 p.—*Link-Belt Co., 307 N. Michigan Ave., Chicago 1. (220AN).*

Dryers, Filters

Dimensions, capacities and part numbers of line of DFN dryers, filters, strainers, charging lines, water bubblers and others.—*McIntire Co., Livingston 11, N. J. (220AO).*

Porous Steel

Types, performance, application data for stainless steel and other metals with controlled porosity. 45 p.—*Micro Metallic Corp., 30 Sea Cliff Ave., Glen Cove, N. Y. (220AP).*

Heating Controls

Information on a complete line of heating controls and parts. Circular 54-H. 46 p.—*General Controls Co., 801 Allen Ave., Glendale 1, Calif. (221A).*

Steel Boilers

Explanation of boilers, water heating products and indirect heating coils.—*Kewanee-Ross Corp., Kewanee, Ill. (221B).*

Refrigeration Coils

Description of coils for use in ice cream hardening rooms, frozen food and storage rooms. Folder 425. 4 p.—*Vilter Mfg. Co., Milwaukee 7. (221C).*

Mounted Drives

Six sizes of steel-shaft mounted drives described with selection and dimension details.—*Falk Corp., Milwaukee 8. (221D).*

MATERIALS HANDLING

Truck Refrigerator

Information on giant-size mechanical refrigerator with 24-gal. capacity for retail dairy trucks. 4 p. bulletin.—*Kari Kold Co., 263 Briarwood Ave., S. E., Grand Rapids 6, Mich. (221E).*

Holding Tanks

Description and illustrations of models of farm holding tanks for dairy use. 8 p. brochure.—*Solar-Sturges Div., Pressed Steel Car Co., Inc., 6600 Narragansett Ave., Chicago 38. (221F).*

Storage Tanks

Information on design and operating features of insulated stainless steel storage tanks. 4 p. bulletin.—*Walker Stainless Equipment Co., New Lisbon, Wis. (221G).*

Refrigerated Tanks

Details on refrigerated storage tanks, with specifications and illustrations. 4 p. bulletin.—*Alloy Products Corp., Waukesha, Wis. (221H).*

Bag Conveyor

Illustrated operating features of flat belt conveyor units. Bulletin 1554. 4 p.—*Stephens-Adamson Mfg. Co., Aurora, Ill. (221I).*

"Box Grab" Movie

Unloading, stacking and loading-out of wooden lugs with "box grab" attachment which eliminates need for pallets by side-squeezing loads. 16 mm. movie.—*Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore. (221J).*

Drum Up-Ender

Description of features and operation of clamping fork attachments for use with drum up-ender. Leaflet.—*Lewis-Shepard Products, Inc., Watertown, Mass. (221K).*

Laboratory Carts

Uses of carts in research, industrial, medical and educational laboratories. 12 p. folder.—*Laboratory Construction Co., 1115 Holmes St., Kansas City, Mo. (221L).*

Truck Bodies

Description of pallet and deck bodies for bottle trucks.—*Herman Body Co., 4400 Clayton Ave., St. Louis 10, Mo. (221M).*

Cooling Tanks

Construction details of milk storage and cooling tanks. Bulletin MST-54239. 6 p.—*Heil Co., Tank Sales Div., Milwaukee 1, Wis. (221N).*

Heavy-Duty Trucks

Information on several models of tractor-trailer combination units. Illustrated bulletins DMA-8465, DMA-8464, DMA-8463. 6, 16, & 20 pp.—*Chrysler Corp., Dodge Div., 7900 Joseph Sampau St., Detroit. (221O).*

Process Belts

Illustrated catalog of features and uses of process belts. Booklet E52.—*Ashworth Bros., Inc., Metal Products Div., Worcester, Mass. (221P).*

Pallet Truck

Easy-to-work-on-truck, 26 in. longer than the load.—*Clark Equipment Co., Powrworker Section, Industrial Truck Div., Battle Creek 14, Mich. (221Q).*

Box Car Unloaders

Double track box car unloader for free flowing materials described and illustrated. Brochure 1654. 4 p.—*Stephens-Adamson Mfg. Co., Aurora, Ill. (221R).*

Hand Lift Truck

Analysis of hand-lift equipment with a check list of 34 questions relating to essential characteristics. Bulletin 1005-A. 4 p.—*Market Forge Co., Materials Handling Div., 33 Garvey St., Everett, Mass. (221S).*

Industrial Trucks

Industrial lift trucks with capacities ranging from 1,000 to 10,000 lbs. described. Attachments for handling different types of loads also discussed. Bulletin 5101C. 12 p.—*Yale & Towne Mfg. Co., 11,000 Roosevelt Blvd., Philadelphia 15. (221T).*

Screens, Feeders

Descriptions of tray type screens, feeders and conveyors. Bulletin FC-3. — *Simplicity Engineering Co., Durand, Mich. (221U).*

Drum Rings

Locking rings for open head drums.—*Drum Parts, Inc., 10311 Meech Ave., Cleveland 5. (221V).*

For Steam Heated VATS or TANKS

Quickly pays back its cost by eliminating OVER-heating, boil overs, wasted heat and damaged products. Powers No. 11 Temperature Regulator shown above is self-operating, easy to install and gives many years of dependable control. It has an easy to read 4" dial thermometer which indicates temperature of liquid being controlled and makes it easy to adjust regulator for various temperatures. Bulletin 329 describes its points of superiority. Write for a copy. (c12)

THE POWERS REGULATOR CO.
Skokie, Ill. • Offices in 60 Cities • See Your Phone Book

Over 60 Years of Automatic Temperature and Humidity Control

This inexpensive filler does your filling job!

SIMPLEX FILLER

Top quality manufacture

Fully guaranteed

- HANDLES LIQUIDS AND SEMI-SOLIDS!
- FILLS 15 OR 30 BOTTLES, JARS OR CANS PER MINUTE!
- ADJUSTABLE 1 TO 32 OZ.!
- EASILY CLEANED!

Write for circular on this model A filler or on the Simplex automatic fillers

F. L. BURT CO • 571 7th STREET • SAN FRANCISCO 3, CALIF.
PHONE KLONDIKE 2-2020

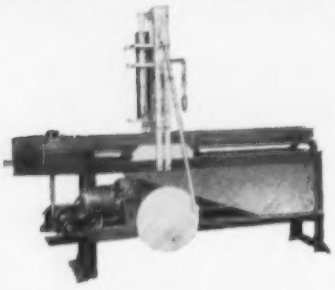
Name .....

Address .....

City ..... State .....

For more information, use coupon on last page.

BURGEE CAN OPENER



Opens . . . Empties . . . Rinses *AUTOMATICALLY!*

- Opens, drains and rinses up to twenty No. 10 cans every minute.
- Handles any liquid or semi-liquid that will drain from a 4-inch opening.
- Needs no operator . . . does the work of four men.
- Provides cleaner, more efficient handling—no loss due to spilling or splashing of product.

For more information about the Burgee Can Opener and its companion unit, the Burgee Can Crusher, write

F. H. Langsenkamp COMPANY

229-235 EAST SOUTH STREET, INDIANAPOLIS 4, INDIANA

One minute with your phone book can

SPEED HANDLING IN YOUR PLANT

When you have a materials handling problem call your Nutting Sales Engineer. He has the answer in the most complete line of Floor Trucks in America. He's backed by 63 years of materials handling know-how and a range of 1000 models and sizes. You'll get perfect adaptability for the job, easier handling, longer life and minimum maintenance.

NUTTING HAND & FLOOR TRUCKS

Trucks for all material handling requirements. Over 1,000 Standard and Special Designs — Platform, Stake, Rack, Box, Shelf, 2-Wheel Rubber Tired Wheels, Casters.

Nutting

"WHERE TO BUY THEM"

Look up your Nutting Sales Engineer under "Casters" or "Trucks" in your classified directory, or write direct.

Nutting

Since 1891

NUTTING TRUCK AND CASTER CO.
3131 Division Street, Faribault, Minn.

Export Sales Rep.: School International, Inc. 4237 No. Lincoln Ave., Chicago 18, Ill.

Trucks

Specification table included with drawings, descriptions of line of hand trucks.—*Wilder Mfg. Co., Inc., Mechanic St., Port Jervis, N. Y. (222A).*

Hand Truck

Construction features and applications of hand truck described.—*Magnesium Co. of America, Materials Handling Div., East Chicago 19, Ind. (222B).*

Delivery Trucks

Tables of weight capacities included with data and photos of delivery vehicles.—*Chrysler Corp., Harper at Mt. Elliot, Detroit 31. (222C).*

Lift Truck

Light weight hand lift truck pictured and described.—*Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15. (222D).*

Pallet Moving

Provides motorized system for horizontal movement of pallet loads of double-faced or single pallets. Bulletin 551. 4 p.—*Barrett-Cravens Co., 628 Dundee Rd., Northbrook, Ill. (222E).*

Fork Trucks

Two kinds of electric straddle type fork trucks described. Circulars 35A, 35B.—*Lewis-Shepard Products, Inc., Watertown, Mass. (222F).*

Conveyor

Natural-frequency conveyors eliminate excessive spillage, cleaning problems. Bulletin 111.—*Carrier Conveyor Corp., 2152 Frankfort Ave., Louisville 6, Ky. (222G).*

Zipper Conveyor

Bulk materials sealed into rubber tube by zipper conveyor elevator that moves with load. Catalog 349.—*Stephens-Adamson Mfg. Co., 6 Ridgeway Ave., Aurora, Ill. (222H).*

Electric Trucks

Attachments and truck which operates in narrow aisles and confined work areas. Sheet 845.—*Raymond Corp., 62-129 Madison St., Greene, N. Y. (222I).*

Stacker

Dual purpose stacker for operations where both a platform and forks are needed.—*Lewis-Shepard Products, Inc., Watertown, Mass. (222J).*

Wire Containers

Brochure, "Duty Designed Cargotainers", gives technical details and applications of welded steel wire mesh containers.—*Pittsburgh Steel Products Co., Grant Bldg., Pittsburgh 30, Pa. (222K).*

Pallet Loader

Illustrated description of automatic pallet loader.—*Food Machinery & Chemical Corp., Riverside, Calif. (222L).*

MAINTENANCE

Glass Blocks

Reference data on physical performance, insulation and light transmission values, and installation of glass blocks for skylights with illustrations. Bulletin 12-J. 8 p.—*Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22. (222M).*

Simplified Lubrication

"How to Simplify and Save" describes pure lubricants, possibility of reducing number used in plants.—*Pure Oil Co., 35 E. Wacker Dr., Chicago 1. (222N).*

Glazing Compound

New non-drying, elastic glazing compound absorbs vibration, reduces glass breakage. Folder 541. 4 p.—*Lincoln Oil and Paint Co., 3921 Mayfield Rd., Cleveland 21. (222O).*

Heating Elements

File of solutions to difficult heating problems due to odd contour shapes, space or weight limitations and others.—*Electrofilm, Inc., P.O. Box 106, N. Hollywood, Calif. (222P).*

Gate Valves

Line of gate valves described, design, construction, quality and control measures included. Bulletin 55G. 4 p.—*Cooper Alloy Foundry Co., Hillside, N. J. (222Q).*

Corrosion Control

How to control corrosion with stainless tubing and pipe, tables, photos, charts and test results included. 28 p.—*Carpenter Steel Co., Alloy Tube Div., Union, N. J. (222R).*

Butterfly Valves

Sizes, pressures, velocities, operators, positioners and advantages of butterfly valves explained in illustrated folder. Bulletin 650-L1. 4 p.—*Builders Providence, Inc., 345 Harris Ave., Providence, R. I. (222S).*

Insulations

Index to line of thermal and acoustical insulations with suggested uses and application methods. Bulletin GL6.C4. 8 p.—*Owens-Corning Fiberglas Corp., Toledo 1, Ohio. (222T).*

Welding Process

New welding process especially suitable for butt welding of stainless and alloy steel pipes. Form 115419. 10 p.—*Arcos Corp., 1500 S. 50th St., Philadelphia 43. (222U).*

Lubrication

Explanation of how colloidal dispersions are used for dry film lubrication. Bulletin 438. 4 p.—*Acheson Colloids Co., Div. of Acheson Industries, Port Huron, Mich. (222V).*

Clutch

Features and explanation of operation of new clutch. Folder A-634. 4 p.—*Dodge Manufacturing Corp., Mishawaka, Ind. (223A).*

Pressure Relief Valves

Application, construction and features of back pressure relief valves. FR Bulletin 1&2.—*A. W. Cash Valve Mfg. Corp., 666 E. Wabash Ave., Decatur, Ill. (223B).*

Valves

Features of line of valves, gate, globe and angle patterns. Circular AD 2059.—*Crane Co., 836 S. Michigan Ave., Chicago 5. (223C).*

Lubrication

Application, specifications and explanation of lubrication units. Bulletin 806. 4 p.—*Lincoln Engineering Co., 5701 Natural Bridge Blvd., St. Louis 20, Mo. (223E).*

Nuts Offered

Self locking nut samples available with data sheet, specify size desired.—*Standard Pressed Steel Co., Jenkintown, Pa. (223F).*

Spray Painting

Information on spray painting, covering both equipment and technique.—*DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio. (223G).*

Valves, Switches

Characteristics and special features of line of valves and switches. Catalog 4G. 34 p.—*Barksdale Valves, 5125 Alcoa Ave., Los Angeles 58. (223I).*

Battery Manual

Technical training manual on lead-acid storage batteries for electric industrial truck use with photographs, diagrams and tables. 44 p.—*Gould National Batteries, Inc., Trenton 7, N. J. (223R).*

Clutches

Engineering and specification data with application drawings for clutches of six lines. Catalog 102. 20 p.—*Formsprag Co., 23601 Hoover Rd., Van Dyke, Mich. (223K).*

Fasteners

Information on special rivets, nails, screws and small parts. Brochure 58. 10 p.—*John Hassall, Inc., Westbury, Long Island, N. Y. (223L).*

Utility Machines

Describes applications and specifications of utility machines. Bulletin B-1. 4 p.—*Vacu-Blast Co., Inc., Box 885, Belmont, Calif. (223M).*

Valve Protection

Questions and answers designed to help select and maintain valves. —*Cooper Alloy Foundry Co., Hillside, N. J. (223N).*

Conveyor Belt Lacing

Illustrated description of conveyor belt lacing. Booklet A-60.—*Flexible Steel Lacing Co., Lexington St., Chicago 44. (2230).*

Free Literature—Fast Way

Any of these very-latest catalogs, bulletins, or folders will be sped to you gratis. Just note here the specific literature you want, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service postcard — back of book. Then sign at the bottom and mail.

For your convenience, too, all items in this department are listed and keyed in the Reader Service Section.

SANITATION

Dust Collector

Wet type dust and fume collector illustrated and discussed.—*Van-Truer Co., Inc., 12600 Beech Road, Detroit 23. (223D).*

Heat Exchanger

Automatically cleaned heat exchanger described, illustrated.—*Sanitary Processing Equipment Corp., 54-17 Queens Blvd., New York City. (223P).*

Sanitary Pumping

Variable capacity sanitary pumps, connected to variable speed power units. Illustrated folder FE.—*Viking Pump Co., Cedar Falls, Iowa. (223Q).*

Air Conditioning

Regulated humidity, temperature for factories. Bulletin 3703A. —*Buffalo Forge Co., Broadway, Buffalo, N. Y. (223J)*

Sanitary Fittings

Illustrated description of stainless steel sanitary fittings.—*Alloy Products Corp., Waukesha, Wis. (223H).*

PERSONNEL

Accident Rates

Report on 1953 accident rates of all companies listed with the Natl. Safety Council, including food and meat packing industry rates. 1954 Catalog.—*National Safety Council, 425 N. Michigan Ave., Chicago 11. (223T).*

Asbestos Gloves

Line of asbestos gloves and mittens for improved heat protection. Leaflet 10M-6-54.—*Miller Products Co., Inc., 29 Warren St., New York City 7. (223U).*

QUALITY CONTROL

Assay for Vitamin

Services offered described in booklet, "Assay for Vitamin D". Price list for samples included.—*Public Relations Dept., Foster D. Snell, Inc., 29 W. 15 St., New York City 11. (223S).*

Strahman

SEATLESS PISTON VALVES

1. No wire drawing
2. No cracked discs
3. No seats to regrind
4. Positive shut-off

THE HEART OF THE STRAHMAN VALVE

Piston is shown entering the ring . . . partly closed

Consult your dealer or write for complete catalogue and specifications

STRAHMAN VALVES, INC., 16 HUDSON STREET NEW YORK 13, U.S.A.

IMMEDIATE DELIVERY
FROM FACTORY STOCKS

STAINLESS STEEL INSTANT DISCONNECT COUPLING

Is rust or corrosion in your lines a problem? Must your lines resist acids, remain sanitary? Now you can get immediate shipment from our factory of #303 and #316 Stainless Steel Snap-Tite Couplings. No waiting for special production runs on sizes through 2".

Steady demand has made Stainless Steel Couplings a standard Snap-Tite product. And, because they're standard, the price is lower.

Liberal discounts to O.E.M. users

SNAP-TITE COUPLINGS CAN HANDLE ALMOST ANYTHING THAT FLOWS

See Snap-tite's representative., or write for Bulletin 240

Snap-tite, INC.

UNION CITY 6, PENNSYLVANIA

You can Buy No Finer DEEP WELL TURBINE

CAPACITIES TO 5,000 G.P.M.

HEADS TO 400 FT.

OIL LUBRICATED (Bulletin 102-A)

WATER LUBRICATED (Bulletin 102-AA)

For dependable, low cost deep well water supply, install a Deep Well Turbine Pump "by Aurora." It will be a pleasure to send you descriptive data to explain why these distinguished pumps deliver an exceptional degree of satisfaction through EXTRA YEARS.

Write for Details

DISTRIBUTORS IN PRINCIPAL CITIES

AURORA PUMP DIVISION

THE NEW YORK AIR BRAKE COMPANY

91 DEARBORN STREET AURORA • ILLINOIS

For Flavor That Freezing Won't Kill, Use Natural Spices

American Spice Trade Association

82 WALL STREET, NEW YORK 5, N. Y.

first in Transport Refrigeration

• BETTER DESIGNED
• BETTER BUILT
• BETTER SERVICED

ThermoKing

44 S. 12th St. Minneapolis, Minnesota

PROCESSING

Roll Machines

Facts on continuous-feed automatic roll machines with speeds up to 25 pieces per min. and scaling range of 1 oz.-4½ oz. 4 p. brochure.—*Bakery Div., American Machine & Foundry Co., 261 Madison Ave., New York City 16. (224A).*

Fabricated Equipment

Information on line of products and facilities for manufacture of custom food equipment. Bulletin 550.—*L. O. Koven & Bro., Inc., 154-D Ogden Ave., Jersey City 7, N. J. (224B).*

Mixer

Explanation of stainless steel agitator with many illustrations.—*Falloy Co., Inc., Chamber of Commerce Bldg., Newark 2, N. J. (224C).*

Process Equipment

Description of process equipment of all types with illustrations, and specifications. 20 p.—*Pottstown Metal Products, Div. of Cochrane Corp., Pottstown, Pa. (224D).*

Bottle Counters

Specifications and illustrations of models of bottle counters for use on fillers, crowners, washers, conveyors, etc. Catalog 51. 4 p.—*Durant Mfg. Co., 1929 N. Buffum St., Milwaukee 1. (224E).*

Steam Blancher

Stainless steel steam blancher with accessible interior for easy cleaning may be used on wide variety of fruits and vegetables.—*A. K. Robins Co., Inc., 713-729 E. Lombard St., Baltimore 2, Md. (224F).*

PACKAGING

Waxing Help

A-C Polyethylene minimizes accumulation of wax on filler section runners, makes stronger dairy cartons. Samples available.—*Semet-Solvay Petrochemical Div., Allied Chemical & Dye Corp., 40 Rector St., New York City 6. (224G).*

Tape Uses

Applications to packaging of acetate fibre tapes.—*Minnesota Mining & Mfg. Co., St. Paul 6, Minn. (224H).*

Casing Machine

Description of apparatus to automatically transfer bottles from line into cases.—*Walker-Wallace Ltd., 17 Cornwall St., Toronto, Canada. (224I).*

Bottle Filler

Components of paper bottle filler which is fully automatic listed and illustrated. Bulletin G-501. 4 p.—*Cherry Burrell Corp., 427 W. Randolph St., Chicago 6. (224J).*

INSTRUMENTS

Pressure Pilot

Features and operation of new pressure pilot with incorporated pressure gauge. Booklet P-1. 4 p.—*U. S. Gauge, Div. of American Machine & Metals, Inc., Sellersville, Pa. (224K).*

Density Control

Syrup density control system and other control instruments. Catalog 500.—*Taylor Instrument Co., Rochester, N. Y. (224L).*

Automatic Analysis

Principle and operation of new instrument for automatic analysis of incoming raw materials and finished products.—*North American Philips Co., Inc., Mount Vernon, N. Y. (224M).*

Weighing Machine

Powdered and granulated materials automatically weighed and delivered into containers.—*C. A. Brinkmann & Co., 378-380 Great Neck Rd., Great Neck, L. I., N. Y. (224O).*

Control Instruments

Summary of indicating, recording and controlling instruments with text and photographs. Bulletin GL-1. 4 p.—*U. S. Gauge, Div. of American Machine & Metals, Inc., Sellersville, Pa. (224P).*

INGREDIENTS

Algin Gels

Properties, preparation and uses of gels made from algin products listed.—*Kelco Co., 31 Nassau St., New York City 5. (224Q).*

Story of Cacao

Illustrated booklet tracing history and development of cacao. Part of Advances in Chemistry Series.—*Rockwood & Co., Brooklyn 5. (225R).*

Products Listed

Details of variety of products and suggested usages for manufacturers of foods, confectionery, beverages and others.—*Florasynth Laboratories, Inc., 900 Van Nest Ave., New York City 62. (224S).*

Corn Sweeteners

Discussion of corn sweeteners in bread with diagrams and bibliography. 32 p.—*Corn Products Sales Co., 17 Battery Pl., New York City 4. (224T).*

Flavor Booster

Description of vanitrope, a new strong flavor-enhancer.—*Shulton Inc., 630 Fifth Ave., New York City 20. (224U).*

Let's face it!

HAVE YOU A DISASTER PLAN FOR YOUR PLANT?

BOMBS... OR FIRE... OR FLOOD... OR TORNADO ... you can handle them if you act now.

Let's face it... the threat of war and the atomic bomb has become a real part of our life—and will be with us for years. Fires, tornadoes and other disasters, too, can strike without warning.

Whatever the emergency is, everybody's going to want help at the same time. It may be hours before outside help reaches you. The best chance of survival for you and your workers—and the fastest way to get back into production—is to know what to do and be ready to do it. Disaster may happen TOMORROW. Take these simple precautions TODAY:

☐ **Call your local** Civil Defense Director. He'll help you set up a plan for your offices and plant—a plan that's safer, because it's integrated with community Civil Defense action.

☐ **Check contents** and locations of first-aid kits. Be sure they're adequate and up to date. Here, again, your CD Director can help. He'll advise you on supplies needed for injuries due to blast, radiation, etc.

☐ **Encourage personnel** to attend Red Cross First-Aid Training Courses. They may save your life.

☐ **Encourage your staff** and your community to have their homes prepared. Run ads in your plant paper, in local newspapers, over TV and radio, on bulletin boards. Your CD Director can show you ads and official CD films or literature that you can sponsor locally. Set the standard of preparedness in your plant city. There's no better way of building prestige and good community relations—and no greater way of helping America.

Act now . . . check off these four simple points . . . before it's too late.

INGREDIENTS
For the Food Processor

CARROT OIL

makes food

golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.

Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET

New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO., INC.
PHILADELPHIA, PA.
3 WAREHOUSE LOCATIONS
Proper Temperature for Frozen Foods

PROFESSIONAL SERVICES

BRADBURY RESEARCH ASSOC., INC.
Food Plant Consultants
PLANT SANITATION — MANDATORY LABELING, LABORATORY SERVICES; Filth in foods, food analysis, bacteriological tests.
817 Moody Street — Waltham 54, Mass.

FOOD DEVELOPMENT LABORATORY
S. W. ARENSON, *Director*
Ingredient evaluations • New products development. Specializing in flour, shortenings, milk and other basic ingredients. • Facilities: chemical and physical laboratory, bakery, spray dryer and other unit process equipment.
2865 W. Franklin St., Baltimore 23, Md. — 440 W. 24th St., New York, N. Y.

Send for Free Brochure on
INDUSTRIAL SANITATION SERVICE
dealing with sanitation programs—water supply and conservation—waste disposal—training programs and investigations
COMPLETE SANITATION CONSULTANT SERVICE
offered West of the Rockies only!
INDUSTRIAL SANITATION SERVICE
Benjamin Buchalter, *Director*
626 Potrero Ave., San Francisco 10, Mission 7-2225

LEWIN ASSOCIATES
Industrial Consultants
DAVID N. LEWIN, Ph.D., FOOD CONSULTANT
JOSEPH D. LEWIN, CONSULTING ENGINEER
Design — Layouts — Investigations — Consultations — Reports — Market Investigations — Bakeries, Dairy Products—Food Preserving by Heat, Drying, Freezing—Consultation in Managing, Warehousing, Distribution — Formulae, New Products.
243 West 56 St. N. Y. 19, N. Y. — JUdson 6-1749

SCHWARZ LABORATORIES, Inc.
Consultation on Food Problems
Analyses of Foods and Beverages
Food Plant Design and Process Improvement
Research and Investigations
Legal Testimony
Write for bulletin describing facilities and services
230 Washington St., Mount Vernon, N. Y.

FOSTER D. SNELL, INC.
Research Laboratories
SENSORY PANEL TESTS
Food Analysis, Stability Studies, Evaluations, Packaging Problems, Vitamin Assays.
Write For
Food and Vitamin Booklets
29 W. 15th St., N. Y. 11 — WAtkins 4-8800

STRASBURGER & SIEGEL
Chemists—Bacteriologists—Food Technologists
Specialists in Canned and Glassed Foods
Laboratory Services
Testing Tomato Products, Mayonnaise, Pickles, Oils, Fats, Beverages, Sugars, Filth in Foods, Food and Drug Labels, Expert Testimony
1403 Eutaw Place — Baltimore 17, Maryland

DONALD K. TRESSLER & ASSOCIATES
Gerald A. Fitzgerald, Vice-Pres., Director
Specialists in Food Preparation, Preservation, Process Development, Production and Quality Control; Equipment and Package Testing and Evaluation; Cold Storage; Quick Freezing; Canning; By-Product Utilization; Natural Flavor Essences; Plant Sanitation and Pest Control; Home Economics; Surveys; Ethical Legal Work.
North Compo Road, Westport, Conn.
Telephone: CApital 7-6865

WILLIAM C. WINOKUR
Consulting Food Technologist and Chemist
Surveys, developments, research.
Specialists in beverages, flavorings, soups, soluble coffee and soluble tea.
144-21 Charter Road — Jamaica 35, New York
Telephone AXtel 7-7387

WISCONSIN ALUMNI RESEARCH FOUNDATION
Project Research, Consultation, and Production Control Services in
Biochemistry, Chemistry, Bacteriology, Entomology, and Pharmacology
Write for Price Schedule
P. O. Box 2059-P — Madison 1, Wisconsin

SEARCHLIGHT SECTION

NUTRITIONIST

Technical Service department of prominent manufacturer of fine chemicals for the food and pharmaceutical industries wants outstanding nutritionist.

This is a top-level job requiring frequent contact with other nutritionists in the food industry, medicine, and academic research. Applicant should be able to correlate data and write up information for sales staff and customers. Familiarity with literature and governmental regulations necessary.

Right person will be able to take full advantage of laboratories, literature and contacts of well-established team. Advanced degree required. Some travel. Headquarters, Metropolitan area. Salary open.

In reply state age, experience, education, and salary desired.

P-5336, Food Engineering
330 W. 42 St., New York 36, N. Y.

FOOD TECHNOLOGIST

Excellent opportunity for Food Technologist or Food Chemist who is qualified to conduct product development in foods. Bachelor's Degree or higher. Experience in food research and analytical work desired but not essential. Salary commensurate with ability and experience. Send complete resume of experience and education to:

H. F. S.
Personnel Dept.
PILLSBURY MILLS, INC.
Minneapolis 2, Minn.

ENGINEERING EXECUTIVE
Manufacturer of ovens and equipment for the Biscuit and Cracker Industry offers unusual opportunity. Applicant must be trained, successful engineer who has had experience either in designing equipment for the Biscuit and Cracker Industry or as an engineer in a Biscuit and Cracker plant. The advertiser's employees have been notified of this advertisement.
P 5081 FOOD ENGINEERING
520 N. Michigan Ave. Chicago 11, Ill

CAN MACHINERY DESIGNER AND SERVICE MEN
Excellent opportunities available for permanent positions with leading can machinery builder's expanding operations in midwest. Service men should have experience in can manufacturing plants.
P-5335, Food Engineering
330 W. 42 St. New York 36, N. Y.

WE NEED
FOOD TECHNOLOGISTS and FOOD CANNING CANDIDATES
—junior to top-level
Call, write or wire:
Gladys Hunting (Consultant)
Drake Personnel, Inc.
7 W. Madison St. — Chicago 2, Ill.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)
LOS ANGELES: 1111 Wilshire Blvd. (17)

POSITIONS VACANT
(Additional Position Vacant Ads on opposite page)

FLAVOR CHEMIST: Eastern, well established manufacturer offers unusual opportunity for long-term employment—to the right man. Experience in product development and flavor analysis essential. Salary commensurate with experience and ability. All replies held in strictest confidence. Give age, educational background and experience in replying to P-5076, Food Engineering.

PROCESSOR OF Maraschino cherries. Location metropolitan New York. Must be steady, reliable know his business. Write complete details, age, background, physical description, reason for wanting change. P-5269, Food Engineering.

FOOD TECHNOLOGIST with initiative and imagination to develop new products and improve on existing line of frozen seafoods and poultry. Able to develop Quality Control and Products Development program. Challenge for right person with growing frozen food concern. P-5280, Food Engineering.

SELLING OPPORTUNITY OFFERED

ASSISTANT SALES Manager. Opportunity for alert young business executive. Managing peanut butter and packaged nut sales to super markets. Minimum 5 years sales experience. Unusual growth and profit opportunities. Age 25-34. Complete resume, stating salary range. SW-5307, Food Engineering.

(Continued on opposite page)

LATE-TYPE PROCESS EQUIPMENT
Reduced For Quick Sale

UNION Rebuilt Machinery
Established 1912

FILLERS & CAPPERS

Elgin 24-Head Rotary Vacuum Filler.
Capem 1 SF 4-Head Auto. Capper.
Stokes & Smith G1, G2 and HG88 Duplex Auger Fillers.
Whiz Packer and Triangle Vol. Fillers.
Triangle Package Models A3, G2C, G2S, A6CA, Elec-Tri-Pak Fillers.
Horix 14-Head Rotary Filler.
Pfaudler King C9 Stainless Steel Rotary Gravity Filler.
Filler 4, Hope 6 S.S. Piston Fillers.

MIXERS

Day, Robinson Dry Powder Mixers and Sifters, 200, 600, 1500, 10,000 lbs.
850 gal. Steel Vertical S. J. Mixer, M.D.
Day 650 gal. Jacketed Jumbo Mixer.
Day, New Era, Hottman Mixers 2 to 3500 gals. with/without Jackets, Single and Double Arm Agitators.
Mikro 2SH, 1SH, Bantam Pulverizers; Schutz O'Neill Mills.
Tyler Hummer #27 2-Deck Sifter.

WRAPPERS

Stokes & Smith A and B Transwraps.
Doughboy, Amsco Rotary Bag Sealers.
American Can 0-8 Rotary Can Closer.
Standard-Knapp No. 429 Carton Sealer.
Haysson; Package Machy. Co. FA, FA4, DF, CA2; Miller, Scandia and Oliver Automatic Cellophane Wrappers.
Pneumatic Automatic Cartoning Unit, 60 and 30 per min.
Hudson Sharp Campbell Auto. Cellophane Wrapper.
Standard Knapp No. 429 Carton Sealer.

LABELERS

Kyler A, Burt Adj. Wraparound Labelers.
Pony Model MX Labelrites.

MISCELLANEOUS

Fitzpatrick "D" Stainless Steel Comminuter, with and without Auto. Screw Feeds, Jacket Chamber.
F. J. Stokes Rotary Tablet Machine.
Colton 2, 3RP, 4 Tablet Machines.
Sperry 12" S. S. P. and F Filter Press.

Additional Information and Quotations Available On Request
Write Today or Wire Collect

UNION STANDARD EQUIPMENT CO.
318-322 Lafayette Street New York 12, N. Y.

TOP PRICES PAID
FOR YOUR
SURPLUS EQUIPMENT

(Continued from opposite page)

POSITIONS WANTED

MANAGER-PRODUCTION, plant, general. Age 35. Prodigious experience canning fruits and vegetables. Available March 1st. PW-4809, Food Engineering.

WANTED: A position with opportunity, not a job. Food Technologist with over 15 years production, research and development of various foods desires challenging and responsible position. Major products are beverage bases, condiments, canned foods, vitamins, flavorings, soup bases. Specialist in soluble coffee production and development. Respected and well-liked by subordinates, associates and superiors. Available for consulting and part-time projects. PW-5385, Engineering News-Record.

CHEMICAL ENGINEER—5 years design, production and administrative experience. Specialist in production control, original research and new product development. Good mechanical background. Knowledge of frozen food concentrates. Presently employed. Desires position with scope and responsibility. Will relocate. PW-5165, Food Engineering.

ATT. CANNER, Processor, Food mchry. mfr. Experienced top man seeks position with future in production, design, development, products, processes, machines. Now with leading national packer veg., juices, frozen items, meats etc. Reg. Chem. Mech. Engr., IFT, ACS, AIChE. PW-5211, Food Engineering.

BUSINESS OPPORTUNITY

For Sale or long term lease, complete canning plant for tomatoes, peas, potatoes, green beans located in fertile East Texas near large metropolitan markets. Good labor supply. Reasonable terms. BO-4235, Food Engineering.

Product Processes Wanted

We are prepared to purchase formulae of or make arrangements for the manufacture of your food products in our area. Send us samples and particulars for further consideration.

BONUS FOOD LTD.
154 W. 5th Ave. Vancouver, Canada

- FOOD - TECHNOLOGIST

We need a food technologist with a minimum of 4 years experience in control, research and/or production, for responsible work in our food laboratory.

We are a medium-size multi-plant organization with headquarters in the metropolitan N. Y. area and our product line includes a wide variety of bake goods, soups, vegetables and meat products, both canned and frozen. Our requirements are exacting, but the man who meets them can look forward to a stimulating career with a congenial and progressive company.

Send us full details about yourself including age, education, experience and past earnings to:

P-5455, Food Engineering, 330 W. 42 St., New York 36, N. Y.

USED MACHINERY
FOR SALE

2 Style-O-Matic Jar Unscramblers,
2 O&J Labelers,
2 Kiefer Vari-Visco Fillers

FS-5435, Food Engineering
330 W. 42nd St., New York 36, N. Y.

Below being replaced by larger equipment all in good condition.
2—60 gal. Groen S.S. Steam Jcktd. Kettles $90 ea.
1—60 gal. S.S. Steam Jacketed Kettle $100.00
1—30 qt. Hobart mixer with whips, bowls $395.00
½ & 1 ton refrigeration compressors complete with condensers less motors $45.00 each
1 model 60 Todd Protectograph check writer $50.00
1 larger Buffalo-chopper revolving table-knives $145

McARTHUR FOOD PRODUCTS
8029 Humble Rd. Houston 16, Texas

BUYER WITH CASH

Wants to expedite production. Needs Food Processing Equipment including Aluminum and S/S Kettles, Mixers, Vacuum Pans, Dehydration equipment, Grinders, Elevators, Stills, Colloid Mills, Conveyors, etc. Will consider buying set up plant operating or shut down. Give full particulars.

P. O. Box 1351
Church Street Sta., New York 8, N. Y.

"Rome wasn't built in a Day"...

It's taken us **38 YEARS** to build our reputation for **QUALITY EQUIPMENT**

Saving Time and Money

3—#12 Sweetland Filters, 48 cc. bronze Monel covered leaves, 3" cc.
1—Read-Standard Horizontal Ribbon Mixer, 2000#, 480 gal. Practically new; other sizes to 100#.
1—50 gal. Stainless 347, Calandria Still, Agitated, Motor Driven, Sight Glases, with Condenser.
1—50 gal. Stainless 347, Jacketed, Agitated Tank, Motor Driven.
1—Sharples #C27 Super Dehydrator, S.S.
1—Sperry 24"x24" C.I. P.I. & Frame, 25 chambers, 2" cake.
15—Sperry 10"x18" cast iron Filter Presses, P. & F., 11 chambers.
1—Fitzpatrick Model D S.S. Comminuter, S.S. Hopper, S.S. Screen.
3—450 gal. S.S. Steam Jckid. Kettles.
1—Buflovak 48"x40" Flaking Roll, chrome plated, S/S ends.
3—Devine #28 Vacuum Shelf Dryers, ea. 20 shelves, 50x78" Complete.
1—Oliver Rotary Filter, 6'x6', Acid Construction.
4—Mojonnier, S.S. Vac. Pans, 3', 5' 6'.
3—6'x50' Louisville Rotary Tube Dryers.
1—Day size 30 Imperial jacketed 75 gal., Sigma Blades.
3—Mikro Pulverizers, 2TH, 4TH.
4—Buflovac Atmo. Dbl. Drum Dryers 24"x36", 32"x90", 42"x120".
3—Anco 4'x9' Chilling Rolls.
1—300 gal. Stainless jacketed, agitated Reaction Kettle.
4—A.T. 60" S.S. Centrifugals.

Only a Partial Listing
Send Us Your Inquiries

WANTED

YOUR SURPLUS MACHINERY OR PLANTS . . .

☐ SEND US
☐ YOUR LIST
☐ TODAY . . . .

*Our 38th Year

CONSOLIDATED PRODUCTS COMPANY, INC.

56 BLOOMFIELD STREET
HOBOKEN, N. J. Tel: HOboken 3-4425
N. Y. Tel. CIrcle 7-0600

FMC

TOP QUALITY EQUIPMENT AT LOW REBUILT PRICES

30 Years of Reliability
YOUR BEST GUARANTY

Modern Late Models for

- Canning
- Cooking
- Labelling
- Grinding
- Mixing
- Filling
- Packaging
- Cutting

LARGEST STOCK in the EAST for FOOD PROCESSING

COMPLETE PLANTS FOR SALE

- Cotton Seed Oil
- OIL EXPELLER
- PECTIN EXTRACTION
- VEGETABLE CANNING
- FRUIT AND CITRUS JUICE
- YEAST • DRY ICE
- DISTILLERY • PET FOODS

SEND US YOUR INQUIRY

FRED R. FIRSTENBERG, *Pres.*

FIRST MACHINERY CORP.
209-289 Tenth St., Brooklyn 15, N. Y.
ST. 8-4672

FOR SALE

2,000 gal. Horiz. S.S. Tank, 5' x 14'.
Double Effect S.S. Evaporator.
Buflovak S.S. Spray Dryer, 500 lb. per hr.
6 ft. S.S. Heat Exchanger, 96—1" s.s. tubes.
75 gal. Monel Jktd. Kettle, 30" x 27", agit.
100 to 300 gal. S.S. Mix Tanks, water jkt.
250 gal. S.S. Closed Tanks, insul., agit.
300 gal. Horiz. S.S. Tank, 3' x 7', agit.
650 gal. Horiz. S.S. Tank, 4' x 7'.
32" x 52" & 36" x 84" Double Drum Dryers.
26" Centrifugal Extractors, 3 H.P.
75 to 1,500 gal. Homogenizers or Viscolizers.
5 Unit Room Coolers, Freon or Ammonia.
3 H.P. Freon Compressor Unit.
3,000 gal. Glass Lined Tanks, S.S. D.X. coils.
15—S.S. Tables, 36" wide x 68" long.
Milk Pasturizers, Coolers, Filler, Washers.

Send us your inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York 17, N. Y.
Murray Hill 2-4616

PACKAGING EQUIPMENT

Standard Knapp 4-lane packer for bottles, never used.
U. S. Bottlers rinser for pints and quarts, reconditioned.
Horix 24-spout rotary stainless steel filler.
8—A. O. Smith one-piece glass-lined tanks, 17,550-gal. each, 9' O.D. x 40' long.
3—Same as above except 5,100-gal. cap. each, 7' dia. x 20' long.

CHARLES S. JACOBOWITZ CORP.
3080 Main St. Buffalo 14, N. Y.

FOR SALE

New Jersey "Pony" Model 864 labeler, will handle labels 3⅛ x 3⅛, immediate delivery.

GLASS-LINED TANKS—5—8525-gal. one-piece A. O. Smith glass-lined tanks, measuring 108 dia. by 16' long, immediate delivery; ideal for all types of foods; with manholes and sanitary fittings.

FS-5205, Food Engineering
330 W. 42 St., New York 36, N. Y.

FOR SALE

Frick 7" x 7" Ammonia Compressors, New 50% Discount. 300 ½" Frick New Globe Valves.

DAVIS SUPPLY CO.,
FLINT, MICHIGAN

IN STOCK

STAINLESS STEEL TANKS

1—10,500 horiz.—UNUSED
1—7150 gal. Vert.—Used
1—6500 gal. Vert. Clad—Used
1—4500 gal. Vert.—UNUSED
1—2000 gal. Vert. Clad—Used
1—2000 gal. Vert.—UNUSED
1—1000 gal. Vert.—UNUSED
20—from 15 gal. to 500 gal. sizes

STAINLESS STEEL JKTD. KETTLES

1—2600 gal. T347, Vacuum
1— 500 gal. 54" I.D. x 55" H, closed top
2— 450 gal. Agitated cone bottom
1— 200 gal. Readco Dbl. motion agit.
1— 150 gal. Lee—Used
2— 65 gal. Pfaudler—UNUSED
4— 50 gal. Lee, tilting, 125# pr.
20—40, 60 & 80 gal. St. St. Clad
3—Fitzpatrick Comminuting Machines, St. St., models D, D-6 and F

ALSO—Stainless steel columns, heat exchangers, condensers, filters, etc.

PERRY EQUIPMENT CORP.
1411 N. 6th St. PHILA. 22, PA.

FOR SALE

Model 200 Niagara Cello Bag Automatic Packaging Machine

beans, rice, etc. either 1# or 2# size, perfect operating condition.

GEO. F. MARTIN & COMPANY
Watsonville California

TWO "YORK" 10 x 10

AMMONIA COMPRESSORS

Still erected, late model, York Model D8, installed new in 1946, with G.E. 100 HP, 550 volt, synchronous motors, exciters, panelboards, all controls; bargain price.

FS-5207, Food Engineering
330 W. 42 St., New York 36, N. Y.

MEC SPECIAL OFFERS SAVE 50% OR MORE ON GOOD USED BUYS.

1—Carrier 24 Truck Dryer Steam Heater
1—Swenson Vacuum Cooling Crystallizer Double Effect—Cap. 1670# Hr.
1—Feinc 6' Dia. S.S. Filter 24 Sq. Ft.
1—Feinc 3' x 1" S.S. Rotary Vac. Filter
1—Buflovak 6' dia. Vac. Crystallizer
1—Double Drum Dryer 48" x 108"
8—Devine #27 & 28 Vac. Shelf Dryers, 17 & 20 Shelves 58" x 78"
1—Buflovak 20 Shelf Vac. Dryer 42" x 42"
3—Stokes 6 Shelf Vac. Dryers 24" x 36"
6—Ribbon Mixers 400 to 4000# Cap.
1—Sweetland #12 Filter—72 Brze. Leaves
5—Pfaudler 100 Gal. New Vac. G.L. Receivers
1—Mikro 2TH Pulv. 15 H.P. motor
3—N. J. Label-Dri TO Labelers
1—Stokes B-2 Rotary Tab. Machine
3—Pfaudler Reactors 100, 300 & 1000 Gallons
1—Stainless Steel Mixer 1800# Horiz. Spiral
New Stainless Steel & Steel Spiral Mixers; Kettles & Jack. Tanks.

Send for our latest bulletins

THE MACHINERY & EQUIPMENT CORP.
533 West Broadway, New York 12, N. Y.
GRamercy 5-6680
Harry Pearlman, Pres. Bill Wolf, Vice-Pres.

A BRILL BUY
... IS THE BEST BUY

LIQUIDATION

4—Pfaudler 5,000 gal. glass lined Tanks 9' x 9'6".
2—5,000 gal. Horizontal Tanks, 316 S.S., 6'0" dia. x 20'.
2—Pfaudler 2300 gal. glass lined Tanks 78" dia. x 96".
3—Pfaudler 1,000 gal. glass lined, jacketed, agitated Reactors.
2—Leader 1500 and 1000 gal., 316 S.S. jacketed, agitated Reactors.
2—Western Precipitation 304 S.S., jacketed and heated "Holo-Flite" screw conveyor Dryers, 50 ft.
2—Buflovak 6'x5'6" Monel single drum Flakers.
1—Link Belt 316 S.S. Twin Screw Conveyor 18" x 72'.
1—Bucket Elevator 40'8" high, stainless steel buckets and housing.
3—Pfaudler 390 sq.ft., 316 S.S. Heat Exchangers.
2—Ingersoll-Rand 200 and 130 ton Jet Refrigeration Units.
1—Foster Wheeler 2.7 million BTU Dowtherm Unit.
2—Patterson 6' dia. Conical Blenders.

NEW 1953—Immediate Shipment
Send for Complete Bulletin
Wire! Phone! Write!

BRILL EQUIPMENT COMPANY

2401 Third Ave., New York 51, N. Y.
Tel: CYpress 2-5703—Cable: Briston, N. Y.
Houston Office: 4101 San Jacinto St.
Houston 4, Texas. Tel: LOcust 1251

MODERN PACKAGING EQUIPMENT
FOR IMMEDIATE DELIVERY

PNEUMATIC HIGH SPEED Cartoning Line, consisting of: Automatic Feeder, Bottom Sealer, Filler, Top Sealer & Compression Unit.
PNEUMATIC SCALE CO. Large and Small Liners.
PNEUMATIC SCALE CO. Tightwrap, High Speed.
PNEUMATIC SCALE CO.—WORLD and PONY fully automatic and semi-automatic labelers, 60-120 per minute.
PNEUMATIC SCALE CO., CONSOLIDATED AND RESINA fully automatic Cappers, 1, 3 and 4 Head.
STANDARD-KNAPP Model 429 Case Sealer and Compression Unit.
STANDARD-KNAPP Case Loader and Unloader.
STOKES & SMITH model HG84, Twin Auger Filler with Vacuum Attachment, Also Models G and GD.

Partial List—send for complete list of equipment in stock

WANTED

PNEUMATIC SCALE CO. automatic feeders and bottom sealers. Medium or high speed. Will also purchase complete lines.
PACKAGE MACHINERY CO. Model FA or FAQ cellophane wrappers.

ALLIED EQUIPMENT CO.
940-946 Nepperhan Ave., Yonkers 3, N. Y.
Phone: Yonkers 5-0442

IN STOCK AT LOEB'S

Cappers: Capem, Titecap, Swanson, U. S. automatic and semi-automatic.
Centrifugals: Fletcher 12" copper, 17" stain. steel, 20" lithcoated, Tolhurst 26" copper, 32" rubber covered.
Clarifiers: De Laval model 84-51.
Collectors, dust: bag 5" dia. x 2½' to 5' long, steel.
Condensers: stainless steel and copper.
Conveyor Tables: belts from 5½" wide x 12' long, and up.
Cutters, silent: Buffalo 32" and 43".
Dicer: Sterling model EMIC-S/N2.
Dryer: Devine 2 x 4' vac. drum, st. steel.
Extractor: Troy 26" monel basket.
Feeders: Syntron F-22, 10 x 36" trough.
Fillers, liquid: Peerless 6 valve, Cass gross weight, siphon and vac. types.
Fillers, piston: Stokes, Colton, Elgin, Filler Machine Co. for jars, tubes.
Fillers, powder: Speedee, Triangle, Stokes & Smith, Ferguson.
Filter Presses: Sperry, Shriver 6"-42", recessed and plate and frames types.
Filters: int. pressure—Alsop, Sparkler, Lomax, Industrial, Sweetland.
Filter, vacuum: Oliver 2½ x 1', Denver 1 x 3'.
Fryolators: Pitman gas fired, 18" well.
Heater tubular: Creamery Package 65 sq. ft., stain. steel.
Kettles: Stainless steel 5 to 150 gal., with and without agitators, aluminum 40 to 100 gal.
Labelers: Burt, Knapp, New Jersey, World, Ermold—auto. and semi-auto.
Mills, attrition: 30" 40 hp.
Colloid: Charlotte 3 hp., Premier 3 hp. and 7½ hp.
Hammer: Micro 1SH, 2DH, Gump #1, Prater, Raymond, Jay Bee, Jeffery 30 x 24", Williams #2 and BX. Fitzpatrick Homoloid model J.
Mixers: Dough type single and double arm, 5 to 100 gal.
Powder: 50 to 2000 lb. capacity.
Portable electric: ¼ to 5 hp.
Pan, vacuum: stain. steel 30 x 48".
Pasteurizer: Wallace-Walker plate type, 200 GPH., st. steel.
Peeler: Blakeslee model SN-27146.
Press: Davenport continuous #3A.
Pumps: Centrifugal, rotary, gear, vacuum, all types and sizes.
Retorts: 42 x 72" and 24 x 30".
Screens: Rotex 20 x 48", 42 x 84".
Roball 40 x 120" stainless steel.
Selectro 4 x 10', Abbe Blutergess #1.
Sealers, carton: Standard-Knapp, Ceco, Triangle, Packomatic.
Sterlizers: Climax 20" x 36" jacketed.
Still, vacuum; 500 gal. stain. steel.
Tanks: Glass lined, various sizes.
Stain. steel 25 gal. to 1200 gal.
Viscolizer: 150 gal. Cherry-Burrell.

Send us your inquiries and list of idle equipment.

LOEB EQUIPMENT SUPPLY CO.

820 West Superior St. — Chicago 22, Ill.
Telephone: Seeley 8-1431 — Our 31st Year

WE HAVE IN STOCK
FOR IMMEDIATE DELIVERY
THE FOLLOWING TYPES OF EQUIPMENT

BOILERS	MIXERS
CANNING	MOTORS
CONFECTIONERY	PUVERIZERS
DAIRY	PUMPS
FILLERS	REFRIGERATION
MATERIAL HANDLING	SCALES
STAINLESS STEEL JACKETED KETTLES	STAINLESS-STEEL TANKS
MEAT PACKING	LARGE & SMALL STEEL TANKS

Consult Us for Your Food Processing Equipment
Send Us Your Inquiries
We Buy One Item or Entire Plants

AARON Equipment Company
1347 So. Ashland Ave., Chicago 8, Illinois
PHONE: CHesapeake 3-5200

MARCH SPECIALS

Phila. 2 piston SS Filler, late model
MRM Rotary SS 12 Spt. Vac. Filler
2200 & 3400 gal. SS Storage Tanks
Premier SS 6" & 3" Colloid Mills
56 cu.ft. SS Spiral Mixer, New, never used
Resina Capper LC2, up to 80 MM
MRM SS 6 spt. Gallon Vacuum Filler
70 cu. ft. Jktd. Spiral Mixer, 10 HP.

NEW—Steel & S/S Mixers, Kettles, Tanks, & Dryers Fabricated To Your Spec. Engineering Advice Available

We Buy Complete Plants Or Single Units
WHAT HAVE YOU FOR SALE?
YOU CAN BANK ON

EQUIPMENT CLEARING HOUSE, INC.
111 33rd STREET, BROOKLYN, N. Y.
SOuth 8-4451—4452—8782

BREWERY LIQUIDATION

We are dismantling the complete Northampton, Pa. brewery. Have all equipment for sale at attractive prices including Meyer Cataract pasteurizer, copper kettles, glass-lined tanks, Vilter ammonia compressors, air compressors, conveyors, washers, labelers, fillers. Write for free list.

CHARLES S. JACOBOWITZ CORP.
3080 Main St. — Buffalo 14, N. Y.

Lectro Dryer Assembly

Laboratory size Pittsburgh Lectro Dryer, Brown Compressor and Motor with drying cabinet, heating unit and piping connections all assembled; practically brand new; used 4 days only, $250 complete.

FS-5229, Food Engineering
520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE

38" Copper Coating Pans with stem coils
300 gal. Copper Still with condenser and tank
100 qt. 3 speed Read Master Mixer
80 qt. M-80 4-speed Hobart Mixer
100 gal. Copper Steam Jacketed Mixing Kettle
York Freon Compressor with 1½ H.P. 3 phase motor
Burns Split Nut Peanut Blancher

SAVAGE BROS. CO.
2636 Gladys Ave. — Chicago 12, Ill.

ADVERTISERS IN THIS ISSUE

Abbott Laboratories 161
Allis-Chalmers Mfg. Co. 4
American Bag & Paper Corp. 189
American Can Company 56–57
American Norit Company, Inc. BL204
American Spice Trade Association LC224
Angelus Sanitary Can Machine Co. 210
Armstrong Cork Company 35
Atlas Powder Company 109
Aurora Pump Company
The New York Air Brake Company TL224

Barnes Company, W. F. & John 32–33
Barry-Wehmiller Machinery Co. 182
Bausch & Lomb Optical Co. 170
Beckman Instruments, Inc. 54
Bliss Company, E. W. 132
Buffalo Forge Company 124
Bump Pump Company BL205
Burt Co., F. L. BR221

Cambridge Wire Cloth Co., The 157
Canning Machinery Division
Food Machinery & Chemical Corp. 8, 104
Century Electric Company 37
Cherry-Burrell Corporation 12
Chisholm-Ryder Company
Hanover, Pa. BR217
Niagara Falls 159
Clark Equipment Company 47, 49
Consolidated Packaging Machinery
Corporation 176
Copeland Refrigeration Corporation 193
Corning Glass Works 51
Counsel Machine Company BR201
Crane Co. 123
Croll-Reynolds Co., Inc. 174
Crucible Steel Co. of America 151
Cyclone Fence Dept. Div. of
United States Steel Corporation 143

Daniels Manufacturing Co. 115
Darnell Corporation, Ltd. 164
Dempster Brothers, Inc. 14–15
Distillation Products Industries
Eastman Kodak Company 34
Dorsey Trailers 202
Dow Chemical Company 173
Dow Corning Corporation 188
du Pont de Nemours & Co., (Inc.), E. I.
Polychemicals Dept. 19

Eastman Chemical Products, Inc. L214
Ecko Products Company 22
Entoleter Division, The Safety Car
Heating & Lighting Company, Inc. 149

Firmenich Incorporated 43
Fiske Brothers Refining Co.
Lubriplate Division 166
Flexible Steel Lacing Company BL206
Food Machinery & Chemical Corp.
Canning Machinery Division 8, 104
Frick Co. BL208, BR209
Fritzsche Brothers, Inc. 53
Fulton Sylphon Division
Robertshaw-Fulton Controls Company 145

Gardner-Denver Company 100
Gas Atmospheres, Inc. 191
Gates Rubber Company, The 140
Gaylord Container Corporation ..... Third Cover
General American Trans., Corp.
Louisville Dryer 6
G & H Products Corporation TL206
Globe Woven Belting Co., Inc. 180
Goodrich Company, The B. F. 10
Gottscho Inc., Adolph BR203
Goulds Pumps, Inc. 153
Great Lakes Carbon Corporation
Dicalite Division 52
Grinnell Company, Inc. ..... Second Cover

Hammel-Dahl Company 138
Hayssen Mfg. Co. 167
Heekin Can Co., The 31
Hoerner Boxes, Inc. 106
Hoffmann-La Roche, Inc. 18
Hudson-Sharp Machine Co. 154
Huron Milling Company, The 152

Ingersoll-Rand 213
Ingredients for the Food Processor 226
International Harvester Company 110

Jamison Cold Storage Door Co. 155
Jenkins Bros. 23
Johns-Manville Corporation
High Temperature Insulation 148

King Co. of Owatonna, The BR214
Koven & Bro., Inc., L. O. 156

Ladish Co.
Tri-Clover Division 185
Langsenkamp Co., F. H. TL222
La Porte Mat & Mfg. Co. TR203
Lee Metal Products Co., Inc. 192
Link-Belt Company 17, 28
Lubriplate Division
Fiske Brothers Refining Co. 166
Lunn Industries 150

Marley Company, The 212
Master Electric Company, The 127
Mears-Kane-Ofeldt, Inc. 184
Merck & Co., Inc. 219
Meyer Mfg. Co., Geo. J. 24
Minneapolis-Honeywell Reg. Co.
Industrial Division 40–41
Minnesota Mining & Mfg. Co. 178
Mixing Equipment Co., Inc. 117
Mojonnier Bros. Co. 216
Morningstar, Nicol, Inc. TR195
Morton Salt Company 231

Nash Engineering Company 16
National Starch Products, Inc. 147
Niagara Blower Company 168
Nicholson & Co., W. H. TR201
Norda, Inc. 128
Nutritional Research Associates 226
Nutting Truck & Caster Co. BL222

Oakite Products, Inc. 160
Oliver Corporation, The
A. B. Farquhar Division TL208

Package Machinery Company 141
Paterson Parchment Paper Company 187
Pfaudler Co., The 36
Pfizer & Co., Inc., Chas. 30
Philadelphia Quartz Co. TR207
Phillips Co., The Thomas 165
Pittsburgh Corning Corporation 25
Plastics Mfg. Corp., J. E. TR217
Pneumatic Scale Corp., Ltd. 198
Powell Valves 112
Powers Regulator Co., The TR221

Quaker City Cold Storage Co., Inc. 226

Reeves Pulley Company 175
Refined Syrups & Sugars, Inc. 136
Renneburg & Sons Co., Edw. BL194
Riegel Paper Corporation 163
Rietz Manufacturing Co. TL204
Robbins & Meyers, Inc. 144
Robins & Company, Inc., A. K. 190

Robertshaw-Fulton Controls Company
Fulton Sylphon Division 145
Ryerson & Son, Inc., J. T. TR209

Shippers' Car Line Corporation 142
Snap-Tite, Inc. BR223
Sparkler Manufacturing Co. 48
Staley Mfg. Co., A. E. 177
Standard Conveyor Company 172
Standard Oil Company (Indiana) 38
Star-Kimble Motor Division
Miehle Printing Press & Mfg. Co. 158
Sterwin Chemicals Inc.
Vitamins Division 181
Strahman Valves, Inc. BL218, TR223
Sugar Information, Inc. 26–27
Sunkist Growers 103
Swift & Company 39

Taylor Instrument Companies 20–21
Thermoid Company 215
Timken Roller Bearing Company, The 44
Toledo Scale Co. 183
Ton-Tex Corporation TL194
Tri-Clover Division
Ladish Co. 185

Ungeror & Co. 50
United States Gasket Company 179
United States Steel Corporation
Cyclone Fence Department 143
U. S. Thermo Control Company 46, BL224
Upco Company, The TL218

Van Ameringen-Haebler, Inc. 58
Victor Balata & Textile Belting Co. R205
Victor Chemical Works 197
Viking Pump Company BR195
Vilter Manufacturing Co., The 146

Walworth Company 169
West Disinfecting Company 45
Western Precipitation Corp. ..... Fourth Cover
Westinghouse Electric Corporation
Sturtevant Division 55
Weston Electrical Instrument Corp. 122
Where to Store Frozen Foods 226
White Motor Company, The 42
Wiley & Sons, Inc., John BR207
Worthington Corporation
Air Conditioning & Refrig. Div. 232

Yale & Towne Mfg. Co., The 29
Yarnell-Waring Company 186

PROFESSIONAL SERVICES 226

SALES REPRESENTATIVES

ATLANTA 3 ..... William D. Lanier, Jr.
801 Rhodes-Haverty Bldg. ..... Walnut 5778
BOSTON 16 ..... P. T. Fegley
350 Park Square Bldg. ..... Hubbard 2-7160
CHICAGO 11 ..... J. G. Cashin
520 N. Michigan Ave. ..... Mohawk 4-5800
CLEVELAND 15 ..... Thomas E. Taylor
1510 Hanna Bldg. ..... Superior 1-7000
DETROIT 26 ..... Thomas E. Taylor
856 Penobscot Bldg. ..... Woodward 2-1793
DALLAS 1 ..... J. H. Cash
First National Bank Bldg. ..... Prospect 7-5064
LOS ANGELES 17 ..... Gordon Jones
1111 Wilshire Blvd. ..... Madison 6-4323
NEW YORK 36 ..... P. T. Fegley
330 West 42nd St. ..... F. W. McCarthy
Longacre 4-3000
PHILADELPHIA 3 ..... Edward A. Martin
Architects Bldg. ..... Rittenhouse 6-0670
PITTSBURGH 22 ..... Edward A. Martin
7389 Oliver Bldg. ..... Atlantic 1-4707
SAN FRANCISCO 4 ..... Evans Wyckoff
68 Post St. ..... Douglas 2-4600
ST. LOUIS 8 ..... J. G. Cashin
Continental Bldg. ..... Lucas 4867
LONDON, ENGLAND ..... W. J. Tydeman
95 Farrington Street, E. C. 4

SEARCHLIGHT SECTION

(Classified Advertising)

H. E. Hilty, Mgr.

EMPLOYMENT
Positions Vacant 226, 227
Selling Opportunities Offered 227
Positions Wanted 227

BUSINESS OPPORTUNITIES
Offered 227

EQUIPMENT
(Used or Surplus New)
For Sale 227-229

WANTED
Equipment 227

ADVERTISERS INDEX

Aaron Equipment Co. 229
Allied Equipment Co. 229
Bonus Foods Ltd. 227
Brill Equipment Co. 229
Consolidated Products Co., Inc. 228
Davis Supply Co. 228
Drake Personnel Inc. 226
Equipment Clearing House, Inc. 229
First Machinery Corp. 228
Jacobowitz Corp., Chas. S. 228, 229
Kehoe Machinery Corp. 228
Loeb Equipment Supply Co. 229
McArthur Food Products 227
Machinery & Equipment Corp 228
Martin Co., Geo. F. 228
Perry Equipment Corp. 228
Pillsbury Mills, Inc. 226
Savage Bros. Co. 229
Union Standard Equipment Co 227

Frankfurter makers need '999'

So do makers and processors of beer . . . candy canned foods . . . cereals . . . malted milk . . . margarine . . . mayonnaise . . . olives . . . sauerkraut . . . seasonings . . .

Morton '999' Salt
for better flavor and quality

Morton '999' Salt insures uniform flavor and quality in processed foods for two reasons:

1. Morton '999' is *guaranteed* always to contain more than 99.9% pure sodium chloride. The remaining 0.1% (or less) is a neutral inert sodium salt—and never bitter calcium or magnesium compounds.

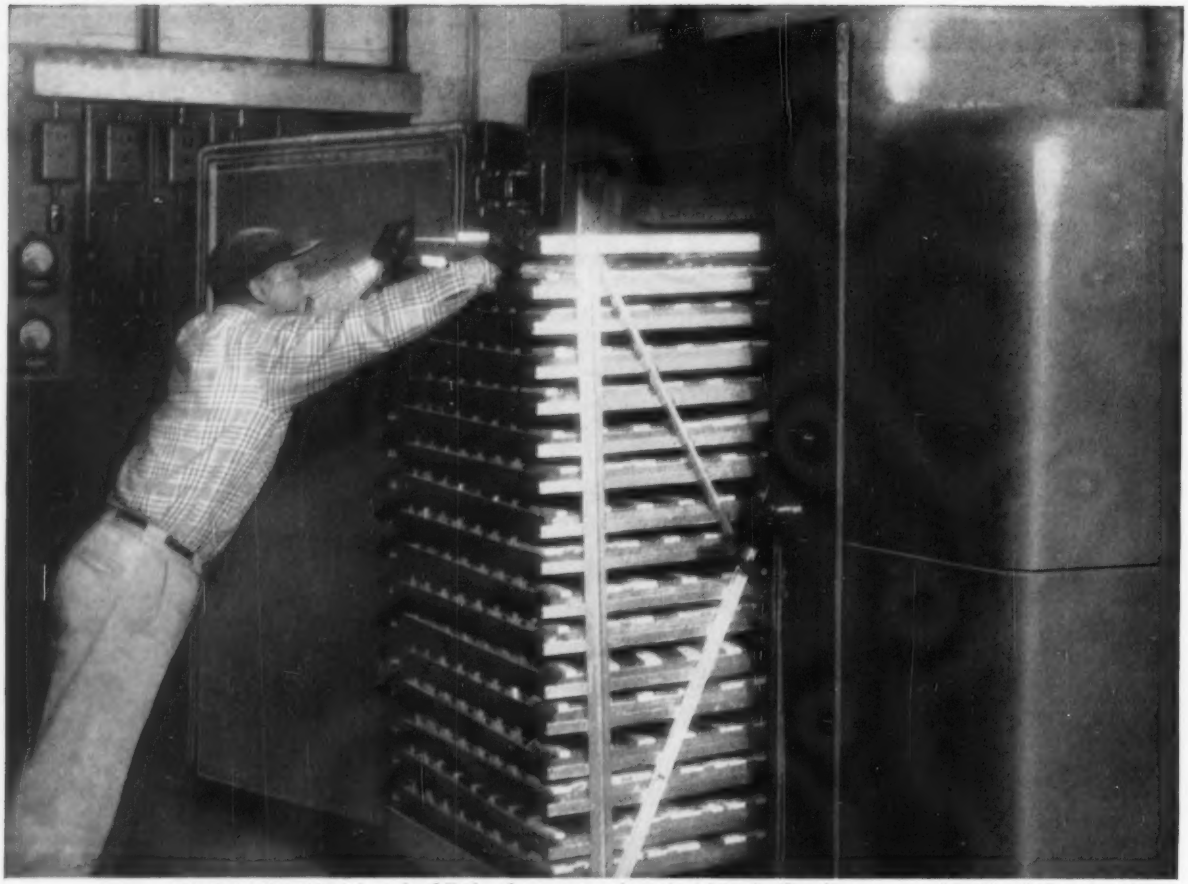
2. Morton '999' Salt is produced by vacuum pan evaporation to assure you a salt that is clean, free-flowing... evenly soluble. It has a more constant weight per volume ratio which insures more accurate salt measurement.

MORTON '999'
the salt that carries its own guarantee

For more information about Morton '999' Salt—and about Morton service and technical help—write this week to:

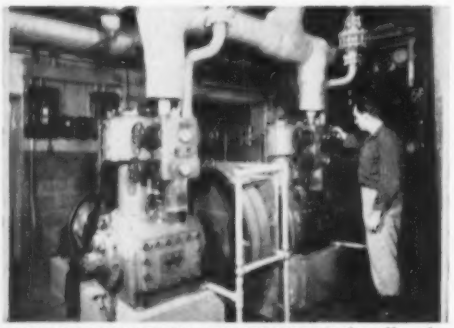
MORTON SALT COMPANY
Industrial Division, Dept. EG-2
120 S. La Salle St., Chicago 3, Ill.

For more information, use coupon on last page.



IT'S COLD IN THERE. A rack of Dulany's asparagus is pushed into the freezing room at the Atlantic Ice plant in Bridgeville, Delaware. Fully automatic Worthington refrigeration equipment keeps the temperature at —5°F.

Putting the freeze on Dulany's asparagus



TWO WORTHINGTON COMPRESSORS handle the refrigeration job at Atlantic Ice. They're equipped with the exclusive Worthington Feather* Valve — the lightest, tightest, most efficient valve made.
* Reg. U.S. Pat. Off.

When Dulany, pioneers in the frozen food industry, leased the Atlantic Ice Manufacturing Company's plant in Bridgeville, Delaware, they picked the right place to freeze and store their products.

Main reason — Atlantic Ice depends on reliable Worthington equipment to handle their refrigeration jobs.

Two of the three storage rooms at Atlantic Ice are equipped with Worthington product coolers; the third uses flooded ammonia coils. Freezing temperature is kept at —5°F by two automatic Worthington vertical ammonia compressors, each rated at approximately 14 tons.

Like Atlantic Ice, more and more frozen food warehouses are finding in Worthington the right source for reliable, economical refrigeration equipment.

Get the whole story on the Worthington line. Contact your nearest Worthington district office or write to Worthington Corporation, Air Conditioning and Refrigeration Division, Section A.4.55-FE, Harrison, N.J. A.4.55

WORTHINGTON

CLIMATE ENGINEERS TO INDUSTRY, BUSINESS AND THE HOME

FOOD ENGINEERING READER SERVICE

For Food-Plant Employees and Consultants Only

Use this POSTAGE-FREE CARD to . . .

1. get more information on packages advertised or described in New Equipment, New Packages, or Just Off the Press
2. subscribe to FOOD ENGINEERING
3. order reprints offered in this issue
4. notify us of a change of address

Product Index on other side

1. FOR PRODUCT INFORMATION

Circle page numbers at right. Suppliers will reply direct to you. No obligation. →

IMPORTANT—FOR PAGES SHOWING MORE THAN ONE ADVERTISED ITEM, USE THIS GUIDE TO NUMBERS ON CARD

37a Bul. 4-1p21
37b Bul. 4-1p31
39 All items shown
39a Pick-up gums
39b Lap-end pastes
39c Case sealer
39d Evertite
51a Cat. EA-3
51b Cat. EA-1
104 All items shown
104a Package freezer
104b Carton filler
104c Can freezer
104d Plunger filler
104e Filler
117 All items shown
117a Cat. DH-50
117b Cat. DH-51
117c Cat. B-102
117d Cat. B-103
117e Cat. B-104
117f Cat. B-105
117g B-107
117h B-108
151 All items shown
151a Book A
151b Book B
151c Book C
151d Book D
151e Book E
158 All items shown
158a Squirrel Cage bul.
158b Brakemotor bul.
158c Wound-Rotor bul.
158d D.C. Motor bul.
164 All items shown
164a Casters
164b Wheels
164c Bumpers
164d Glides
174a Jet-vacuum equip.
174b Condensers
181 All items shown
181a Vitamins
181b Vanillin
181c Colors
181d Roccal
185a Cat. 1-154
185b Cat. 253
186a Steam traps
186b Strainers
188a Antifoam A
188b AF Emulsion
190a Inspection table
190b Equip. cat.
192 All items shown
192a Kettles
192b Mixing tank
192c Pulp tanks
192d Storage tanks
192e Cooling pan
192f Vacuum pan
194a Ton-Tex belting
194b DehydrO-Mat drier
195a Gum Inquiry sheet
195b All items shown
195c Pump Bul. B-E
195d Pump Bul. C-E
195e Pump Bul. D-E
195f Pump Bul. E-E
195g Pump Bul. F-E
195h Pump Bul. G-E
195i Pump Bul. H-E
195j Pump Bul. I-E
195k Pump Bul. J-E
201a Bul. 853
201b Robo-Lift
203a Belting lit.
203b Rolacoder lit.
204a Disintegrators
204b Prebreakers
204c Decolorizing carbons
205a Pumps
205b Victor Supreme
205c Victor 475
206a Valves & Fittings cat.
206b Bul. A-60
208a Bul. 400
208b Refrig. equip.
209a Metals
209b Air-cond. equip.
214a Tenox antioxidant
214b Refrig. bul.
215 All items shown
215a Versicon hose
215b Creamery hose
215c Brewers hose
217a Viz-Pak cat.
217b Jar-cleaning line
218a Hydroment joint filler
218b Hose stations
218c Mixing units
219a Vitamins
219b Chemicals
221a Bul. 329
221b Model A filler
222a Can opener
222b Can crusher
222c Trucks
222d Casters
223a Valve cat.
223b Bul. 240
224a Bul. 102A
224b Bul. 102-AA
224c Natural spices
224d Trans. refrig.
231a Salt '999'
231b Brine-making mtls.

2. TO ENTER SUBSCRIPTION

Use this form. We'll bill you later. →

3. TO ORDER REPRINTS (P. 196)

Circle numbers, give quantity. We'll bill you. →

4. TO CHANGE ADDRESS

Print your OLD address here. →

CIRCLE PAGE NUMBERS BELOW, FILL IN OTHER SIDE, MAIL.

ADVERTISEMENTS

For pages showing more than one advertised item, use guide at left.

2	38	58	122	151d	166	184	195a	208b	218a
4	39	100	123	151e	167	185a	195b	208c	218b
6	39a	103	124	152	168	185b	195c	208	218c
8	39b	104	127	153	169	186a	195d	206a	219a
10	39c	104a	128	154	172	186b	195e	206b	219b
12	39d	104b	132	155	173	187	195f	207	221a
17	40	104c	136	156	174	188a	195g	208a	221b
19	42	104d	138	157	174a	188b	195h	208b	222a
20	43	104e	140	158	174b	189	195i	209a	222b
22	44	106	141	158a	175	190a	195j	209b	222c
24	45	109	142	158b	176	190b	195k	210	222d
25	46	110	143	158c	177	191	197	212	223a
26	47	112	144	158d	178	192	198	213	223b
28	48	115	145	159	179	192a	201a	214a	224a
29	49	117	148	160	180	192b	201b	214b	224b
30	50	117a	147	161	181	192c	202	215	224c
31	51a	117b	148	163	181a	192d	203a	215a	224d
32	51b	117c	149	164	181b	192e	203b	215b	231a
34	52	117d	150	164a	181c	192f	204a	215c	231b
36	53	117e	151	164b	181d	193	204b	216	232
36	54	117f	151a	164c	182	194a	204c	217a	233
37a	55	117g	151b	164d	183	194b	206a	217b	234
37b	56	117h	151c	165					

EDITORIAL

These numbers correspond to numbers in text.

129A	139A	220A	220Q	220AG	221G	222A	222Q	223K	224F
129B	139B	220B	220R	220AH	221H	222B	222R	223L	224G
130A	141A	220C	220S	220AI	221I	222C	222S	223M	224H
130B	141B	220D	220T	220AJ	221J	222D	222T	223N	224I
130C	142A	220E	220U	220AK	221K	222E	222U	2230	224J
131A	143A	220F	220V	220AL	221L	222F	222V	223P	224K
131B	146A	220G	220W	220AM	221M	222G	223A	223Q	224L
131C	146B	220H	220X	220AN	221N	222H	223B	223R	224M
133A	149A	220I	220Y	220AO	2210	222I	223C	223S	224N
133B	150A	220J	220Z	220AP	221P	222J	223D	223T	2240
135A	153A	220K	220AA	221A	221Q	222K	223E	223U	224P
135B	154A	220L	220AB	221B	221R	222L	223F	224A	224Q
135C	157A	220M	220AC	221C	221S	222M	223G	224B	224R
137A	157B	220N	220AD	221D	221T	222N	223H	224C	224S
137B	164A	220O	220AE	221E	221U	222O	223I	224D	224T
137C	164B	220P	220AF	221F	221V	222P	223J	224E	224U

☐ 1 yr. $2 ☐ 2 yrs. $3 ☐ 3 yrs. $4 Domestic rates only. For others, see p. 5.

Product or Service ..... No. Employees in Your Plant .....

8	9	10	11	12	13	14
☐	☐	☐	☐	☐	☐	☐

OLD ADDRESS

No. & Street .....

City ..... State .....

HERE'S WHAT'S IN THIS ISSUE

MAIL CARD FOR MORE INFORMATION

Adhesives 89
Air-cond. equip. 209, 212, 222
Fans 134, 220
Heaters 55
Antifoams 188
Antioxidants 214
Application ideas 220

Batteries 223
Bearings 44
Belting, Chain 32
Cotton-duck 184, 206
Kerosene 10
Lacing for 206
Neoprene 205
Process 221
Steel mesh 203
Blanchers, steam 224
Blocks, glass 222
Boilers 184, 221
Brine-making mtl. 231
Bumpers 164
Bundler, can 178

Cacao 234
Cage, squirrel 158
Can closers 210
Can-making equip. 182
Canning, aseptic 82
Capper, screw 178
Cartoners 141
Carts, laboratory 221
Casers 224
Casters 164, 222
Cellophane 115
Chemicals 197, 219
Citrate, sodium 30
Cleaning equip., jar 217
Spray gun 160
Cleaning mtls. 207
Bactericides 160
Germicidal 157
Sanitizers 181
Closures, cappers 176
Transparent 164
Clutches 228
Friction 158
Coders 203
Collectors, dust 228
Colors, food 181
Compressors 16, 146, 198, 232
Carbon piston 100
Condensers 174
Evaporative 168
Containers 232
Aluminum foil 32
Bag 139
Side-seam 139
Boxes 106
Cans 31, 56
Design for 165
Plastic 19, 217
Wire mesh 223
Controls 220
Automatic 220
Color meter 146
Consistency 40
Contamination 130
Density 234
Laboratory 117, 220, 221
Motors 135
ph 54
Product 234
Recorders 224
Refractometer 170
Temperature 122, 137, 142, 145, 220, 221
Thermocouple 220
Weight 224
Conveyors 172, 208, 222
Bag 221
Chain 32
Elevator-type 201
Guide-rail 179
Hydro-lift 189
Metal 143, 157
Neoprene 180
Plastic 180
Rubber 180
Zipper-type 222
Cookers, pressure 8
Coolers 8, 24, 182
Counters, bottle 224
Couplings, fluid 220
Stainless 223
Crown liner, plastic 164
Crushers, can 222

Descalarisers 204
Design, bag 165
Disintegrators 204
Doors, cold-storage 155
Driers 6, 194, 220
Spray 129
Drives 37, 127, 220
Mounted 221
Speed 175
Vari-speed 17
Drums, up-ender for 221
Rings for 221

Elements, heating 222
Emulsifiers 84, 188
Evaporators 216
Exchangers, heat 223
Exhausters 24, 182

Fabricators 156, 224
Fans, ventilating 134
Feeders 221
Fasteners 223
Fillers 104, 135, 198, 231
Bottle 224
Carton 104
Piston 34
Filteraids 52
Filters 48, 220
Screen 220
Stainless 136
Fittings 188, 206, 230
Glass 51
Sanitary 223
Flavors 50, 53, 224
Butterscotch 128
Fruit 50
Maple 58
Raspberry 43
Spices 224
Vanillin 181, 224

Gears 220
Fruit products 103
Gels 195, 224
Glides 164
Generators, gas 191
Gloves 223
Gums, pick-up 39

Handlers, case 183
Heaters 55
Heating equip. 221
Heists, electric 220
Hollow-fills processor 234
Homogenizers 12
Hoses 215
Stations for 218

Insulation mtls. 223
Asbestos 143
Cork 35
Glass 36

Jet apparatus 220
Jet-vacuum equip. 174
Joint filler 218

Kettles 192

Lacing, belt 206
Loaders, pallet 222
Lubricants 33, 166, 222, 225
Systems 139

Machines, baking 224
Utility 223
Markers 203
Metals 209
Stainless 151, 220
Meters 135
Color 146
Mixers 117, 149
Stainless 224
Water-steam 215
Monoglycerides 34
Monosodium glutamate 152, 177
Motors 127
Brake 158
D. C. 158, 220
Gear 37, 131
Rotor 158
Movies 221

Nozzles, camlock 131
Spray 230
Nuts 223

Openers, can 222

Packaging units 141
Paint remover 157
Palletizers 222
Pallets, paper 131
Pans, cooling 192
Vacuum 192
Paper 168
Parchments 187
Pasteurizers 24, 182
Phosphates 197
Pilots, pressure 224
Pipe & tubing
Glass 51
Plastic 220
Stainless 220, 223
Polyethylene 19, 224
Power equipment 220
Prebreakers 204
Process equipment 224
Processing machines 220
Propylene glycol 173
Protective coatings
Primers 154
Wax 45
Pumps 144, 195, 220
Centrifugal 153, 220
Deep-well 224
Liquid 220
Motor 213
Sanitary 195, 205, 220, 223
Rotary 149
Suction 4

Torque-flow 137
Vacuum 230
Vertical 220

Ramps, hydraulic 220
Rates, accident 223
Refrig. equip. 146, 174, 208, 212, 214
Coils 221
Compressors 16, 100, 232
Condensers 168
Doors, cold-storage 155
Freezers 104, 182
Motor-compressors 193
Package chillers 137
Tanks 221
Trucks 46, 202, 221, 224
Retort control 20
Rope, wire 220
Rubber products 220
Synthetic 223

Salt 231
Scales 183
Screens 221
Gyrating 136
Sealers, case 89
Sheaves 220
Side seam, bag 139
Silicones 230
Sorbitol 109
Spices 224
Stackers 222
Starches 147, 195
Starters, electric 220
Strainers 186
Pipe 148
Suncryl 161
Sugar 36, 136
Supplies, meat-plant 220
Surfacing mtls.
Glazing 232
Paint 232
Tile 230
Sweeteners, corn 234
Switches 223
Syphons, jet 230

Tables, inspection 190
Transfer 180
Tanks
Dairy 221
Mixing 192
Pulp 192
RR 142
Refrigeration 221
Storage 192, 221
Tapes 224
Scotch 178
Thickening agents 147
Tiles, joint filler 218
Tools, cutting 224
Towers, cooling 212
Tractor, operator-led 146
Transmitter, air 220
Traps, air 220
Steam 186, 201, 230
Trucks
Bodies for 221
Cabs for 141
Commercial 42, 110, 222
Dumpers 14
Floor 222
Hand 49, 133, 231, 222
Industrial 29, 47, 49, 221
Plastic 150
Platform 139
Reefer vans 202
Refrig. units 46, 221, 224
Tractor-trailer 221

Turbine, deep-well 224
Unloaders, box car 221

V-belts 140
Valves 123, 138, 206, 220, 223
Anti-corrosion 112
Butterfly 222
Diaphragm 2
Gage-protector 141
Gate 232
Iron body 169
Piston 232
Plug 28
Relief 232
Solenoid 180
V-port 230
Vitamins 18, 161, 219, 238

Weigh-fillers 198, 224
Welding 223
Wheels 164
Wrappers 141, 164, 167
Wrappings, cellophane 115
Paper 168
Plastic 19

PLEASE TYPE OR PRINT—GIVE COMPLETE INFORMATION

Name .....

Position ..... Product .....

Company .....

Street .....

City ..... State .....

February, 1955 Card expires May 10, 1955

BUSINESS REPLY CARD

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

—4¢ POSTAGE WILL BE PAID BY—

FOOD ENGINEERING

READER SERVICE DEPARTMENT

330 WEST 42nd ST.

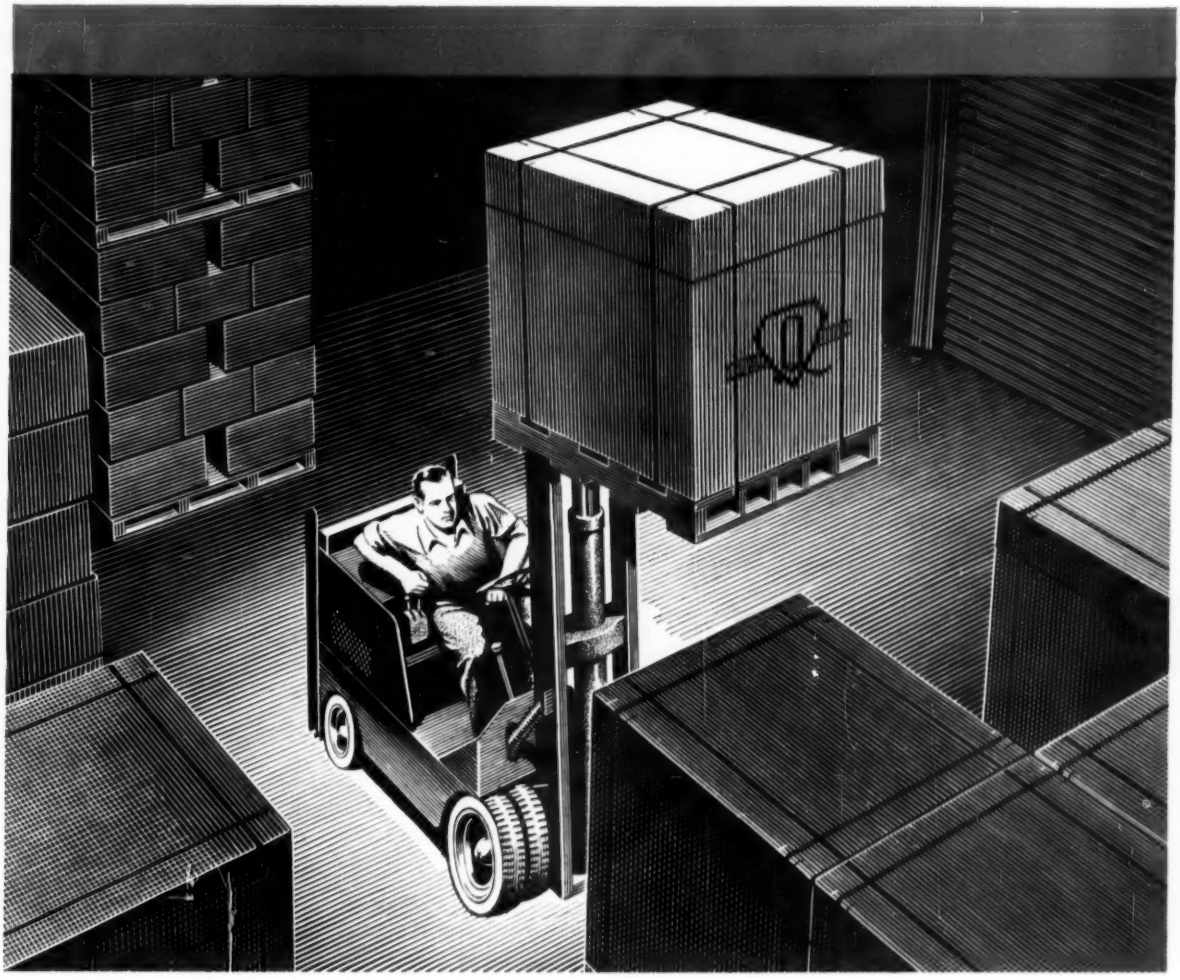
NEW YORK 36, N. Y.

FIRST CLASS

PERMIT No. 64

(Sec. 349, P.L.&R.)

NEW YORK, N. Y.



Help your product "STACK UP" BETTER

Gaylord Boxes

In the warehouse you'll save valuable space because precision-made Gaylord Boxes stack solid, straight...and taller.

In shipment your products will "stack up" better in the eyes of all who see them when they're dressed in eye-catching Gaylord containers.

On arrival your products will "stack up" best; for protection-engineered Gaylord Boxes deliver them in the same good condition in which they left your plant.

Stack the cards in favor of your product. Call your nearby Gaylord sales office today!

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

SALES OFFICES FROM COAST TO COAST ★ CONSULT YOUR LOCAL PHONE BOOK

Technical data on the revolutionary new

holo-flite*

(HOLLOW-FLIGHT)

PROCESSOR

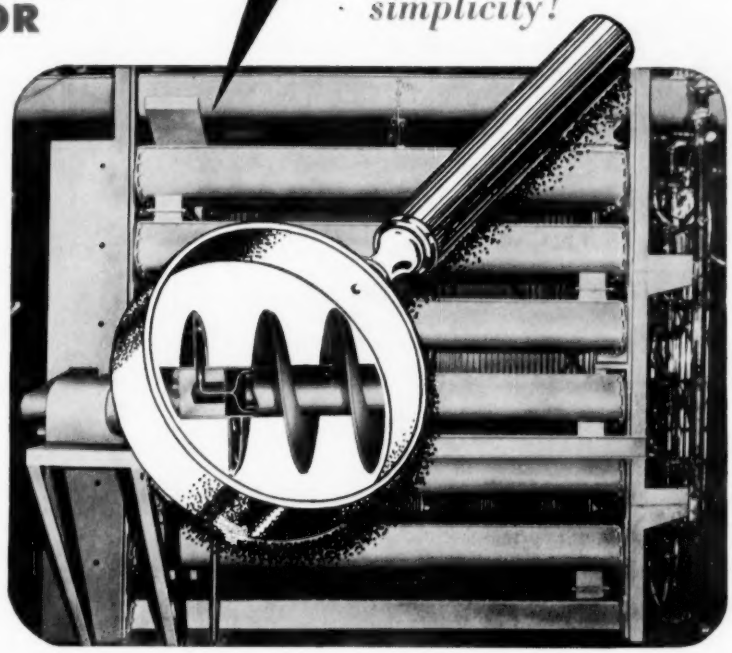
—the Continuous-Flow Heat-Exchanger that is setting new standards of *compactness! adaptability! simplicity!*

If you have processing operations where slurries, solids, pulps or pastes must be cooled or cooked, be sure to investigate the many unique advantages of the newly-developed HOLO-FLITE Processor before you install *any* heat-exchange equipment.

Here's the HOLO-FLITE principle . . .

Two or more screw conveyors rotate slowly in a trough. The blades and shaft of each flight of conveyors are hollow, with provision for circulating the heat-transfer agent through them. The product to be cooled or cooked is moved along the trough, being constantly rotated into, around, over and under the conveyor screws as it moves.

Thus, a continuous thermal transfer takes place between the product and the heat-transfer fluid circulating in the blades. The product is cooled or cooked in *continuous-flow* without the "stop-and-go" losses of batching operations . . . and cooled products can be packaged directly from the HOLO-FLITE discharge—saving space, time and additional handling.



THIS 6-TIER HOLO-FLITE cools 7 tons of cottonseed press cake per hour from 285° to 89°F. *in a total floor space of only 28 sq. ft.* *(Insert)* Enlarged cutaway view of HOLO-FLITE screw showing heat-transfer principle.

Here are typical HOLO-FLITE advantages

The HOLO-FLITE principle is so unique it is setting completely new standards of performance in *many* ways. For example . . .

*Reg. T.M.

The HOLO-FLITE Saves Space —It requires as little as 1/5th the space of other units of comparable capacity because (1) it has far greater heat-transfer area per cubic foot of space . . . and (2) the flights can be "tiered" as high as desired to give maximum capacity in very small floor areas.

The HOLO-FLITE is Versatile— Processed product can be fluid, pulp or paste—granular, crystalline or powdered solid. Heat-transfer fluid can be refrigerant, cooled or ambient water, steam, oil or any other desired fluid, at any normal temperature range.

The HOLO-FLITE Is Dust-Free —Its gentle action provides large heat-transfer action without dust and with negligible particle abrasion. Simplifies installations, assures higher quality product.

The HOLO-FLITE Is Adaptable —It can easily be designed to handle virtually any capacity by (a) varying the diameter of the screws (7" to 16") . . . (b) varying the length of the screws (8 ft. to 20 ft.) . . . (c) varying the number of intermeshing screws per trough (2, 4, or 6) . . . and (d) varying the number of tiers stacked on top of one another (1 to 10, or more).

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1016 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 1 N. La SALLE ST. BLDG., CHICAGO 2
1429 PEACHTREE ST. N.E., ATLANTA 5 • HOBART BLDG., SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

The HOLO-FLITE is in daily operation on such typical products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods and many other equally-varied products.

What is your problem? *Our engineers will be glad to assist you in making the most of* HOLO-FLITE *advantages. Write wire, or phone the office nearest you!*

Want More Facts? This 8 page booklet describing the HOLO-FLITE in greater detail will gladly be sent on request. No obligation, of course.